Clad in iron : assessing the comparative strategic and tactical strengths of British and Union Ironclad programs of the Civil War, 1861-1862

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Clad in Iron:

Assessing the Comparative Strategic and Tactical Strengths of British and Union Ironclad Programs of the Civil War Era 1861-1862

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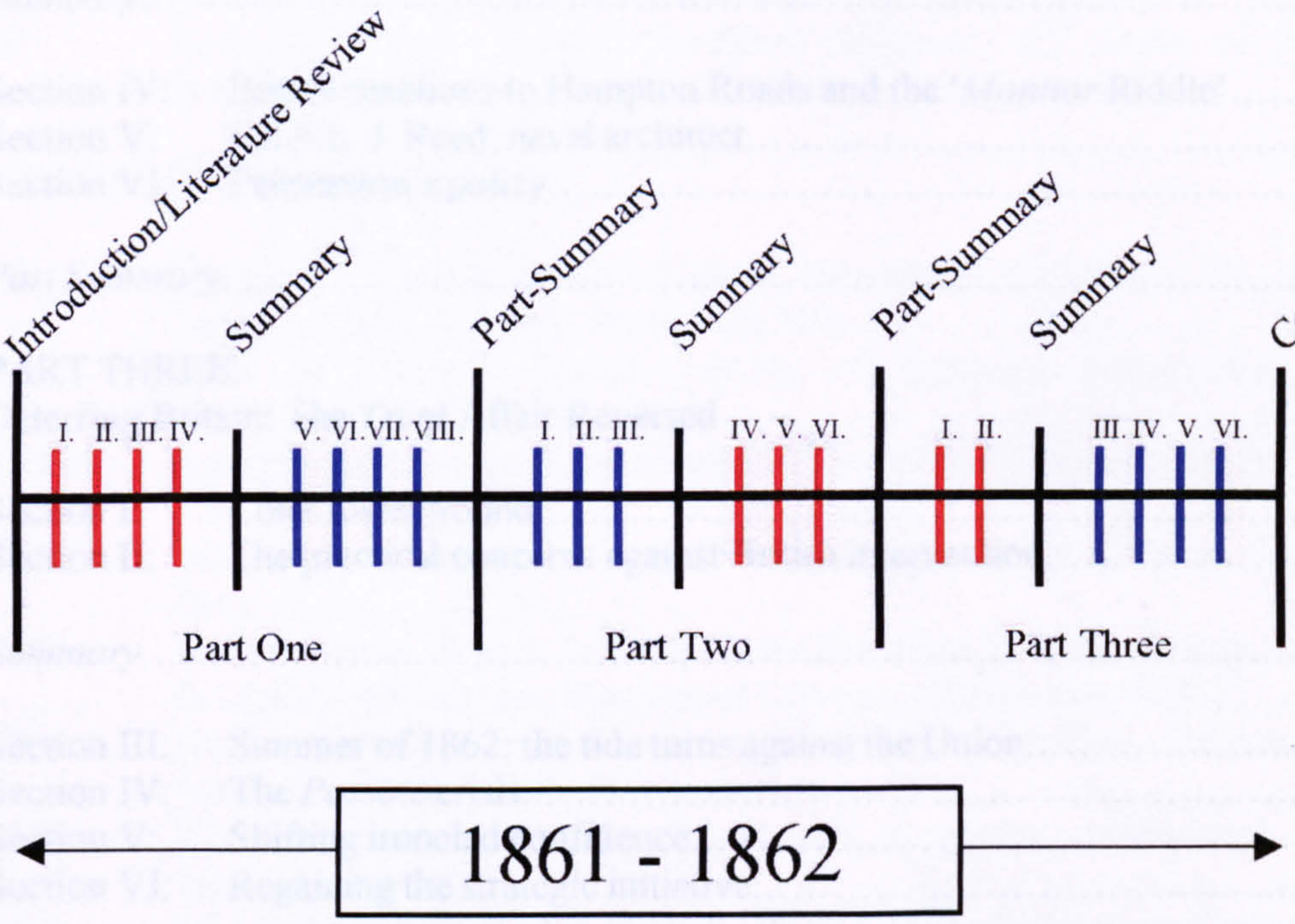
Thesis Structure/Citation Index



Public Record Office, Kew (London):

ADM Admiralty
CO Colonial Office
FO Foreign Office
WO War Office

RG National Archives, Record Group (Washington, D.C.)

ORN *Official Records of the Union and Confederate Navies in the War of the Rebellion*
ORA *Official Records of the War of the Rebellion, Union and Confederate Armies*

Private paper collections (U.K.):

CP Richard Cobden Papers, West Sussex Record Office, Chichester
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GP General Charles Grey Papers, Durham University Library (Archives & Special Collections), Palace Green, Durham

GLB Rear Admiral Sir Frederick W. Grey, Private Letterbook, 1861-66, National Archives of Scotland (General Register House), Edinburgh

MP Vice Admiral Sir Alexander Milne Papers, National Maritime Museum, Greenwich

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BL Oliver Ambrose Batcheller Letters, Manuscript Collection No. 264, U.S. Naval Academy Library, Annapolis, MD

DP John A. Dahlgren Papers, Library of Congress, Manuscript Division, Washington, D.C.

EPPA John Ericsson Papers, American-Swedish Historical Foundation, Philadelphia, PA

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FFP Forbes Family Papers, Massachusetts Historical Society, Boston, MA (copy in Library of Congress, Manuscript Division, Washington, D.C.)

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WP Gideon Welles Papers, Library of Congress, Manuscript Division, Washington, D.C.

Miscellaneous:

Hansard Hansard's *Parliamentary Debates*

PPs Parliamentary Papers

CG *Congressional Globe*

CRs Congressional Reports

FA *Papers Relating to Foreign Affairs* (U.S.)

Thesis Abstract

Great Britain and the United States faced common technological challenges to their naval power, while often teetering on the brink of hostilities with each other, throughout the Civil War era. This combination of rapid industrial-based changes in naval warfare and heightened diplomatic tension yielded contrasting solutions which reflected each nation's unique perspective—and predicament—on foreign affairs. While the Federal Union was from first to last concerned with subduing the rebellion of southern states it also took clear steps in 1861 and 1862 to both prepare for and deter any foreign interference in the conflict, starting with its navy.

Britain's navy, meanwhile, faced a wide range of peace-time problems both foreign and domestic. 'Economising the Empire' while also consolidating its security worldwide, maintaining battlefleet parity, if not superiority, over France, and determining the most effective armoured warships for these seemingly contradictory roles meant that the Admiralty was frequently drawn to the American struggle for providing examples in modern naval warfare, in addition to the strategic implications of an ironclad U.S. Navy. These in turn provoked intense discussion in these years of both tactics and strategy (as they did in the United States) of great importance. The 'tactical' debate over ironclad programs—over the limits and roles of the latest naval technology—led directly to larger issues of national policy.

Moreover, the controversies which evolved on both sides of the Atlantic were not isolated; they originated with and continued to affect one another, American and British, in a precise relationship during a mutually-decisive phase of a common history. This thesis, therefore, is not a mere technical exposition of 'ships' but a study of the men behind their design, construction, and deployment, and the larger technological, political and even social forces affecting these ultimately personal decisions of national—and imperial—defence.

Introduction/Literature Review

Ding, Clash, Dong, BANG, Boom, Rattle, Clash, BANG, Clink, BANG, Dong, BANG, Clatter, BANG BANG BANG! What on earth is this! This is, or soon will be, the *Achilles*, iron armour-plated ship. Twelve hundred men are working at her now; twelve hundred men working on stages over her sides, over her bows, over her stern, under her keel, between her decks, down in her hold, within her and without, crawling and creeping into the finest curves of her lines wherever it is possible for men to twist. Twelve hundred hammerers, measurers, caulkers, armourers, forgers, smiths, shipwrights; twelve hundred dingers, clashers, dongers, rattlers, clinkers, bangers bangers bangers! Yet all this stupendous uproar around the rising *Achilles* is as nothing to the reverberations with which the perfected *Achilles* shall resound upon the dreadful day when the full work is in hand for which this is but note of preparation the day when the scuppers that are now fitting like great, dry, thirsty conduit-pipes, shall run red. All these busy figures between decks, dimly seen bending at their work in smoke and fire, are as nothing to the figures that shall do work here of another kind in smoke and fire, that day.

—Charles Dickens
The Uncommercial Traveller

Plain be the phrase, yet apt the verse,
More ponderous than nimble;
For since grimed War here laid aside
His Orient pomp, 'twould ill befit
Overmuch to ply
The rhyme's barbaric cymbal.

Hail to victory without the gaud
Of glory; zeal that needs no fans
Of banners; plain mechanic power
Plied cogently in War now placed--
Where War belongs--
Among the trades and artisans.

Yet this was battle, and intense--
Beyond the strife of fleets heroic;
Deadlier, closer, calm 'mid storm;
No passion; all went on by crank,
Pivot, and screw,
And calculations of caloric.

Needless to dwell; the story's known.
The ringing of those plates on plates
Still ringeth round the world--
The clangor of that blacksmiths' fray.
The anvil-din
Resounds this message from the Fates:

War shall yet be, and to the end;
But war-paint shows the streaks of weather;
War yet shall be, but warriors
Are now but operatives; War's made
Less grand than Peace,
And a singe runs through lace and feather.

—Herman Melville
A Utilitarian View of the Monitor*'s Fight*

Although historian Stanley Sandler writes that "few exercises are more difficult than an evaluation of the comparative strength of the warships of different nations,"[1] this thesis will examine the correlative development and significance of British and Union ironclad programs during the American Civil War "Era" (roughly 1860-1866), concentrating on the pivotal, decision-making years of 1861 and 1862. The principal reason for this focus rests on three consecutive points:

1. Great Britain was engaged in an ironclad naval arms race against Imperial France, but her most likely antagonist during this period was unquestionably the United States of America.
2. Such a war between the two greatest maritime nations in the world would be primarily a *naval* one[2] fought for "command of the sea", especially the coastal waters of the Northern states themselves.
3. Strategic "sea power"[3] is the tactical supremacy of warships; in this case, the supremacy of individual armour-plated warships to command the seas in question.

The question then is why have there been no comparative studies of this precise *naval* relationship before?

Iain Hamilton has recently come closest, perhaps, with his superlative *Anglo-French Naval Rivalry 1840-1870* (1993). This significantly addressed an important, relatively

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[1] Stanley Sandler, *The Emergence of the Modern Capital Ship* (Newark: University of Delaware Press, 1979), 61.

[2] See for example *Memorandum by Sir John Burgoyne, on the Defence of Canada—February 1862*, signed John F. Burgoyne, Inspector-General of Fortifications, WO 33/11, and especially *Report on the Defence of Canada and of the British Naval Stations in the North Atlantic; together with Observations on the Defence of New Brunswick, &c.*, and *Report on the Defence of the British Naval Stations in the North Atlantic*, 25-1-1865, by Lieutenant-Colonel Jervois, Deputy-Director of Fortifications, WO 33/15.

[3] "Tactics and their partner technology, have meaning for strategy and high policy and often are driven by strategic considerations. With varying success, states try to invest in military technologies that will provide weapons with characteristics most suitable for the protection or advancement of distinctive national interests," Colin S. Gray, *The Leverage of Sea Power: The Strategic Advantage of Navies in War* (New York: The Free Press, 1992), 206-7.

unexplored subject—neglected in naval histories probably because no shots were actually fired in anger during this period; nor did the naval arms race end with (or indeed, help initiate) a great war like the subsequent Anglo-German one. Yet Hamilton was able to shed light on the character of both the British and French navies at a time when Industrial-era technologies threatened to destabilise the European "Balance of Power" at sea.[4] Nevertheless, as A. J. P. Taylor noted, "between 1861 and 1865...when British statesmen thought of war in these years it was with the United States, not with any continental Power."[5] As such, Kenneth Bourne's *Britain and the Balance of Power in North America 1815-1908* (1967) briefly discussed the ongoing Anglo-*American* naval (if not maritime) rivalry, but only as a part of the larger diplomatic relations between the two countries. It therefore offered little insight on how the formulation of national policy crucially affects national warship design—and vice-versa—even though Bourne's 3-part work clearly hinges on the American Civil War years, specifically the *Trent* Affair (November-December 1861), which he regarded as "the most dangerous single incident of the Civil War and perhaps in the whole course of Anglo-American relations since 1815."[6]

The following 3-part thesis also concentrates on the *Trent* Affair, but in direct contrast to the Battle of Hampton Roads (8-9 March 1862). Somehow in the period of these three months, the Anglo-American naval balance of power was completely upset; though Bourne classically derides the Union's force of ironclad-monitors as "unseaworthy"—

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[4] C. I. Hamilton, *Anglo-French Naval Rivalry 1840-1870* (Oxford: Clarendon Press, 1993).
[5] A. J. P. Taylor, *The Struggle for Mastery in Europe: 1848-1918* (Oxford: Oxford University Press, 1954), 129. See also George L. Bernstein, "Special Relationship and Appeasement: Liberal Policy Towards America in the Age of Palmerston", *The Historical Journal*, 41, 3, (1998), 725-750.
[6] Kenneth Bourne, *Great Britain and the Balance of Power in North America 1815-1908* (London: Longmans, Green and Co. Ltd., 1967), 251. See also Norman. B. Ferris, *The* Trent *Affair: A Diplomatic Crisis* (Knoxville: University of Tennessee Press, 1977) and Gordon H. Warren, *Fountain of Discontent: The* Trent *Affair and Freedom of the Seas* (Boston: Northeastern University Press, 1981).

taking contemporary assessments at face value only—he admits "there were still from the British point of view periods of awkward disparity between the two fleets."[7]

A still more comprehensive, comparative naval history is James Phinney Baxter's *Introduction of the Ironclad Warship*, published in 1933, which plumbed British, French *and* American archival sources, but which also ends, not starts, with Hampton Roads. This was because Baxter's purpose, as stated in the Introduction to his *Introduction*, was to debunk American claims that the famous naval battle sounded "the death knell of the wooden walls…" and that the mastless, turreted U.S.S. *Monitor* was the forerunner of the modern battleship. Instead, "Hampton Roads demonstrated and emphasized the foresight of the French", who from 1858 had laid down an entire fleet of broadside-and-sail ironclads, while British Navy Captain Cowper Phipps Coles at least insisted on multiple turrets for his fully-rigged (though ill-fated) experiments.[8]

Deliberately picking up where Baxter left off, Sandler's *Emergence of the Modern Capital Ship* (1979) dropped all pretence of a comparative naval history and sought to give full credit not to Dupuy de Lôme (the brilliant French innovator), Coles, or the *Monitor*'s inventor, John Ericsson, but to Edward J. Reed, the Chief Constructor of the Royal Navy. Though Reed's solution to the vexing paradox of how to reconcile the strategic strengths ideally represented by H.M.S. *Warrior* with the tactical advantages posed by the *Monitor* was the "central battery" ironclad, there is a clear break from his (concentrated) broadside-and-sail H.M.S. *Hercules*, for example, and his mastless, double-turreted H.M.S. *Devastation* (which Sandler and most naval historians, British and American, recognise as the first modern battleship.) Even British naval authority Oscar

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[7] Bourne, *Britain*, 239-40, 273-6, 305-9.

[8] James. P. Baxter, *The Introduction of the Ironclad Warship* (Cambridge: Harvard University Press, 1933), 4; also 302-31. Paul H. Silverstone defines the original *Monitor* as at least the "first ironclad warship built without rigging or sails," *Civil War Navies 1855-1883* (Annapolis: Naval Institute Press, 2001), 4.

Parkes fleetingly observed that "mention must be made of these ships [the monitors of the American Civil War] as they had a certain bearing upon subsequent British designs, to the extent that the *Miantonomoh* idea was behind the *Cerberus* and through her the *Devastation*, while the [Admiralty] Board must have had the *Puritan* in mind when specifying the design of the *Glatton*."[9] Yet Sandler proved unwilling to more fully explore this important connection. "Whether the monitors were a failure" he wrote, "is not so important here as the fact that the reports from America, by both British and American authorities [especially Rear Admiral Samuel F. Du Pont], almost uniformly wrote off the Ericsson monitor as practically useless, particularly for sea service. Such reports could only strengthen the resolve of the controller and the chief constructor and most of the board against any precipitate oceanic turret-ship program. Coles himself termed the federal monitors *wretched vessels*."[10]

Indeed, it was difficult in the early 1860s to see exactly *how* a small coastal defence ironclad of a relatively "provincial" continental power like the United States could ever hope to compare with the large imperial ironclads of England and France—though the comparison was certainly made—and post-"Mahanian" naval historians and "Blue Water" advocates today seem to find it still more perplexing. Examples abound on both sides of the Atlantic. For many revisionist British naval historians, or Royal Navy apologists, there is a defensive tendency to ridicule obviously "inferior" "foreign" navies which may have had "a certain bearing" on Whitehall decision-making, let alone policy-making at Westminster. Andrew Lambert writes of the "block obsolescence of [France's] wooden-hulled [though fully-armoured] ironclads" which "left the Royal Navy pre-eminent." Navies of "The Rest of the World" in the same volume are reduced to pithy

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[9] Oscar Parkes, *British Battleships:* Warrior *1860 to* Vanguard *1950, A History of Design, Construction and Armament* (London: Seeley Service & Co., 1970), 44-8.
[10] Sandler, *Emergence*, 189.

paragraphs on two and a half pages.[11] In *Warrior to Dreadnought: Warship Development 1860-1905* (1997), David K. Brown is even more succinct: "From 1860 to 1905 British warships, with few exceptions, were the best in the world." Like Lambert, however, there is no supportive evidence cited; no foreign research actually conducted off the British Isles. The main agenda instead is to debunk the notion that the "nineteenth-century Navy, and to some extent the Admiralty as a whole, [was] reactionary...the Admiralty was usually the leader and in the few cases when it was not the leader there were usually good reasons and it was not far behind."[12]

This however only replaces a threatened American chauvinism with a "Rule Britannia" one. Meanwhile, "though the subject remains ideologically charged, the passions aroused by British imperialism have so lessened that we are now better placed than ever before to see the course of the Empire steadily and see it whole."[13] Yet even the latest volume of the *Oxford History of the British Empire* primarily ventures "to explain how varying conditions in Britain interacted with those in many other parts of the world to create both a constantly changing territorial Empire and ever-shifting patterns of *social and economic relations.*" Missing here is a sense of how the "Pax Britannica" was dependent upon the ascendancy—or not—of the Royal Navy. "Fundamentally, the British Empire was concerned with power,"[14] notes Peter Burroughs in one essay of this volume; in another titled "Defence and Imperial Disunity" he identifies that "warships restrained the

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[11] Andrew Lambert, *Battleships in Transition: The Creation of the Steam Battlefleet 1815-1860* (London: Conway Maritime Press, 1984), 85; also 101, 109-111. Hamilton effectively doubts this; *Anglo-French*, 97-8.

[12] D. K. Brown, *Warrior to Dreadnought: Warship Development 1860-1905* (London: Chatham Publishing, 1997), 204. See also John F. Beeler, "A One Power Standard? Great Britain and the Balance of Naval Power, 1860-1880", *The Journal of Strategic Studies* (Vol. 15, December 1992, No. 4), 557-560, and *Birth of the Battleship: British Capital Ship Design 1870-1881* (London: Caxton Editions, 2003, reprint of Chatham Publishing 2001), where Beeler states "the manner in which the Board of Admiralty and its technological experts dealt with the financial, technological, strategic and tactical problems confronting them may furnish an instructive example for contemporary ["American"] policy-makers," 12.

[13] Andrew Porter (ed.), *The Oxford History of the British Empire: Volume III, The Nineteenth Century* (Oxford: University Press, 1999), vi, *emphasis mine.*

[14] Peter Burroughs, "Imperial Institutions and the Government of Empire", in Porter, *Oxford History*, 170; 323; 341.

expansionist designs of France and Russia, especially in the crucial Mediterranean corridor; gunboats occasionally backed British diplomatic or commercial ventures with a show of force, as in South America and China; naval squadrons suppressed piracy and African slave trading and guaranteed the openness of the seas." If Great Britain was the "world policeman" of the 19th century, it was this predominating naval presence which gave it real power, if not authority, and supplied the Empire with its ultimate sense of defensive unity. Even current historiographic issues of British "informal" imperialism must take into account an equally informal naval hegemony which both reflected changes in social and economic relations (constituting essentially a maritime empire), but also technological if not political pressures.

In many histories of the period, however, this reality is either assumed or ignored altogether, though "in the nineteenth century it began to appear possible," Michael Howard points out, "for the nation which most effectively applied in its naval building programmes the developing techniques of marine engineering, metallurgy, and artillery construction to pulverize any opposing fleet without its victim being able to land a single shot on its assailant."[15] Burrough's excellent assessment of the central role played by the Royal Navy might thus also benefit with a more thorough understanding of how mid-Victorian naval policy was possibly also the *victim* of an "Imperial Defence" strategy, if it in fact existed in the early 1860s. Where British ironclads could reach but make no impression upon rival, local naval powers the apparatus of world supremacy was lost.[16]

Nowhere was this dilemma manifested more acutely than during the American Civil War crisis in international relations. Winston Churchill, in his illustrious *History of the*

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[15] Michael Howard, *War in European History* (Oxford: Oxford University Press, 1976), 122-3.
[16] See for example, Andrew Lambert, "The Royal Navy, 1856-1914: Deterrence and The Strategy of World Power", in Keith Neilson and Elizabeth Jane Errington (eds.), *Navies and Global Defense: Theories and Strategy* (Westport: Praeger Publishers, 1995), and "Australia, the *Trent* Crisis of 1861, and the Strategy of Imperial Defence", in David Stevens and John Reeve (eds.), *Southern Trident: Strategy, History and the Rise of Australian Naval Power* (Crows Nest: Allen & Unwin, 2001).

English-Speaking Peoples, regarded the nineteenth century as characterised not only by Victorian Britain but the other "Great Democracy": America. Nor did he entertain any serious conflict of interests between the two rising powers—someday to be the closest of wartime allies. Indeed, the formulation of the anti-monarchical, anti-European Monroe Doctrine in 1823 "depended on the friendly vigilance of the 'British man-of-war,' but this fact was seldom openly acknowledged. For the best part of a century the Royal Navy remained the strongest guarantee of freedom in the Americas. Thus shielded by the British bulwark, the American continent was able to work out its own unhindered destiny."[17] During the Civil War, at least, this presence was regarded differently. British interests in keeping "Continental despots" out of Latin America, for example, initiated by earlier aggressive foreign secretaries like George Canning, could turn a sense of protection into mortal intrusion itself when those interests saw fit to change. As long as America's development as a united republic was "dependent" upon the naval supremacy of an imperial, non-republican democracy, she was also a hostage to fate. Consequently, the Union Navy's first concern in the rapid build-up of U.S. naval might was the *exclusion* of influence in American affairs posed by the Royal Navy; though this historical phenomenon stays relatively unappreciated and unexplored.

Indeed, American naval historians have all too often measured the "success" or "failure" of the Union's ironclad program from a determinist perspective. After all, how could a coastal defence warship *be* powerful if it was not yet part of an *imperial* navy? For Harold and Margaret Sprout, in their *Rise of American Naval Power, 1776-1918*, published in 1939, the "Continental" naval strategy of the early United States was a violation of good Mahanian "Maritime" sense:

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[17] Winston Churchill, *A History of the English-Speaking Peoples: Volume Four, The Great Democracies* (New York: Dodd, Mead & Company, 1958), 4: 29-30.

> By unqualifiedly endorsing the shallow draft, unseaworthy monitor-type to the exclusion of sea-going ironclads, not merely as a temporary wartime expedient, but also as a permanent policy, the United States was perpetuating the strategy of passive coast and harbor defense, which had contributed so largely to the disasters of the War of 1812, and which was now failing to save the Confederate seaboard either from blockade or occupation by the Union forces.[18]

But if the real issue was then *type of ironclad*, insofar as this determined which far-reaching *strategy* was best for the survival of the nation, the Sprouts entirely omit to enter into an actual explanation of these ironclads' varying characteristics. Instead it is virtually assumed that recent tactical developments in naval warfare, such as armour plating and super-heavy mounted naval ordnance, made no difference in strategic principle than the earliest days of wooden fighting ships. Bernard Brodie's *Seapower in the Machine Age*, also published on the eve of America's entry into the Second World War, similarly argued "there is no use in rejoicing about an invention which enables the United States, for example, better to withstand the blows of an enemy if it also disables us from retaliating when he strikes at our vital interests abroad." This was the very definition of "sea power", or "command of the sea": "retain seaborne communications for oneself and to deny them to the enemy", while also relying upon the "concentrated strength of a battle force."[19]

Implicit in these works is not how the monitors helped the Union achieve victory in the Civil War, but how they almost prevented it. A very recent study of Du Pont's ironclad repulse before Charleston (7 April 1863) by Robert M. Browning, Jr. ultimately takes the Union admiral's view of events: it was the tools at his disposal which were to blame for

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[18] Harold and Margaret Sprout, *The Rise of American Naval Power, 1776-1918* (Annapolis: Naval Institute Press, 1990 reprint of Princeton, 1939), 188-9.
[19] Bernard Brodie, *Seapower in the Machine Age* (New York: Greenwood Press, 1941; reprinted 1943 by Princeton University Press), 435, 91-2.

his failure, not his leadership.[20] At the same time, William H. Roberts' treatment of the only seagoing broadside-ironclad constructed for the Union Navy before the end of the Civil War, U.S.S. *New Ironsides*, ultimately misses the point of *why* monitor-ironclads were favoured more than possible sisters of her. Unarguably the broadside was more effective in shore bombardment, where number of guns and a "suppressing fire" was more important than individual calibre. This, in combination with *New Ironsides*' 4½-inch thick iron armour, and especially her light draft in comparison with the seagoing ironclads of European powers, made her the most respected ironclad to Confederates huddled in forts. But only the more heavily-armoured, rotating turret could handle the 15-inch Dahlgren, and this was the weapon most feared by Confederate sailors in their own ironclads.[21] Was there more to the attraction of mounting such heavier, if fewer guns—in smaller, less expensive, more quickly constructed, and better protected vessels of even lighter draft—than subduing domestic opposition to the blockade? Roberts does not ask this question, nor does Browning, and relies in its place upon a conspiratorial theory that "politics, desire for commercial advantage, and 'monitor mania', rather than any innate technological superiority allowed the monitor type of ship to dominate the Union ironclad program."[22] Added to this is his obvious disappointment that "the vessels needed immediately took precedence: many shallow-draft armored ships that could operate in the shallow harbors and rivers of the Confederacy, instead of a few expensive ocean-going ships to meet the European ironclads on equal terms at sea," though he later admits—but fails to explain—that the end result of the Union Civil War ironclad program

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[20] Robert M. Browning, Jr., *Success Is All That Was Expected: The South Atlantic Blockading Squadron During the Civil War* (Washington, D.C.: Brassey's Inc., 2002). See also Donald L. Canney, *Lincoln's Navy: The Ships, Men and Organization, 1861-65* (Annapolis: Naval Institute Press, 1998), 195-6, who writes: "This illogic [of attacking Charleston] can only be explained by the 'monitor fever' rampant in the land... one of the earliest examples of the 'magic' of technology when applied to war."

[21] William C. Emerson also points the significant disparity in manpower requirements, since a "crew of thirty-five manned each gun in the main battery; 25 for the gun itself, and 10 stationed at the tackle for the ports. These latter crew also relieved the side-tacklemen in serving the guns in continuous and rapid fire," "U.S.S. *New Ironsides*: America's First Broadside Ironclad", *Warship* (1993), 27.

[22] William H. Roberts, *USS New Ironsides in the Civil War* (Annapolis, Maryland: Naval Institute Press, 1999), xii. See also Spencer C. Tucker, *A Short History of the Civil War at Sea* (Wilmington: Scholarly Resources Inc., 2002), 61.

was that "within a strictly limited sphere (i.e., the coastal waters of the United States), the U.S. Navy was superior to any possible invader."[23]

What these works share in common is their lack of a deliberate comparative approach which, especially concerning Union and British ironclad programs of the Civil War era, must address the roots of naval power itself, as well as decision-making in ships design and national policy. Mahan himself wrote that "the natural tendency of the extreme effort for protection undoubtedly is to obscure the fundamental truth…that the best protection is to injure the enemy," but this did not necessarily answer the question of how the United States was potentially clad in iron—by both Union and British navies—during this crucial interval of technological, political and social upheaval.[24]

Hence, in neither case, the naval or diplomatic histories of the Civil War, has the vital connection between the two approaches been adequately explored. This gap in the literature may stand to reason simply because no naval conflict occurred between Great Britain and the United States, as between American 'North' and 'South'. Yet the entire question of *how* and *why* these two powers avoided a confrontation—which many considered inevitable at the time—is answered only to the point that such a war was considered unnecessary; not the equally important concern of whether it was winnable. "Although naval personnel constituted only 5 percent of the Union armed forces," noted James McPherson in his Pulitzer prize-winning *Battle Cry of Freedom: The Civil War Era* (1988), "their contribution to the outcome of the war was much larger."[25] Yet even in his 2004 Presidential Address of the American Historical Association, McPherson signally ignored the role of this "5 percent" in the British cabinet's fateful deliberations

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[23] Roberts, *New Ironsides*, 122, 124.
[24] Alfred Thayer Mahan, *Admiral Farragut* (London: Sampson Low, Marston & Company, 1893), 324.
[25] James M. McPherson, *Battle Cry of Freedom: The Civil War Era* (New York: Ballantine Books, 1988), 382.

over intervention in the fall of 1862.[26] Howard Jones, in his *Union in Peril: The Crisis over British Intervention in the Civil War* (1992), for example, makes the same general omission though he does at least provide a clue:

> Northerners believed that the *Monitor*'s activities revealed British concern about the Union's strength at the end of the war....[Charles Francis Adams, the U.S. minister to Britain] noted that the Union Navy's new prowess exhibited at Hampton Roads had caused a sensation in England and would probably force a build-up in its own navy and fortifications. He also believed that the Union's military power had neutralized British interest in intervention. That same evening, puffed up by the day's good news, Adams attended a reception held by Lady Palmerston and engaged in a brief conversation with [Secretary for War Sir George Cornewall] Lewis, who uncharacteristically lost self-control and lashed out at the North for seeking to subjugate the South. Reconstruction of the Union was impossible, Lewis exclaimed. Adams cut short the heated exchange by remarking that British desire to see the United States divided was the most compelling argument against allowing that event to take place.[27]

The fact remains—inexplicably dormant—that in 1862 U.S. Secretary of the Navy Gideon Welles could write "we are not, it is true, in a condition for war with Great Britain just at this time, but England is in scarcely a better condition for a war with us."[28] Historical comparisons between American and European navies should therefore not stop for the years 1861-1865 when examining the Union Navy; they should intensify. Nor should histories of America's role as a naval power assume that this great struggle for national identity (what one British historian has defined as "the greatest struggle of the nineteenth century"[29]) was entirely domestic in scope, or that the technologically

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[26] "Presidential Address: No Peace Without Victory, 1861-1865", reprinted in *The American Historical Review*, Vol. 109, No. 1 (February 2004), 1-18.

[27] Howard Jones, *Union in Peril: The Crisis over British Intervention in the Civil War* (Chapel Hill: University of North Carolina Press, 1992), 110-11. See also Howard Jones, "History and Mythology: The Crisis over British Intervention in the Civil War", in Robert E. May (ed.), *The Union, the Confederacy, and the Atlantic Rim* (West Lafayette: Purdue University Press, 1995), 29-67.

[28] Journal entry dated 11-8-1862, in Howard K. Beale (ed.), *Diary of Gideon Welles: Secretary of the Navy under Lincoln and Johnson*, 3 vols. (New York: W. W. Norton & Company, Inc., 1960), 1: 79.

[29] Brian Holden Reid, *The American Civil War and the Wars of the Industrial Revolution* (London: Cassell, 1999), 16.

sophisticated weapon systems devised by the Union Navy—the most advanced ironclad steamers of their kind in the world—indicated a preoccupation solely in that direction. Did 'world naval power' begin or end at one's own shores is a question which needs reconsidering.[30] Even studies of Union Civil War ironclads themselves tend to be near-sighted. The *Monitor* did more than save the blockade from a devastating Confederate challenge, and therefore restore international belief that Federal power was ascendant. In the high stakes game of Civil War diplomacy, it offered President Abraham Lincoln's administration a unique and valuable playing card with which to counter the recent menace of a British counter-blockade of the North.

Perhaps not ironically, one of the few naval histories which stressed this correlation was also the first. Reverend Charles B. Boynton, with the official approval of the U.S. Navy toward the close of the Civil War, began compiling a two volume *History of the Navy during the Rebellion* which laid particular stress on the influence of British sea power upon American history. Completed three years after hostilities ended, Boynton, Chaplain of the U.S. House of Representatives and Assistant Professor at the U.S. Naval Academy, saw fit to make the following remarkable observation: "While our Army has done a work beyond all praise, and has settled the question of our ability to defend our territory against any force which could be brought here, the Navy has saved us from foreign intervention that could not have been otherwise avoided, while at the same time its labors in putting down the rebellion have been far greater than has been generally supposed." Clearly, the

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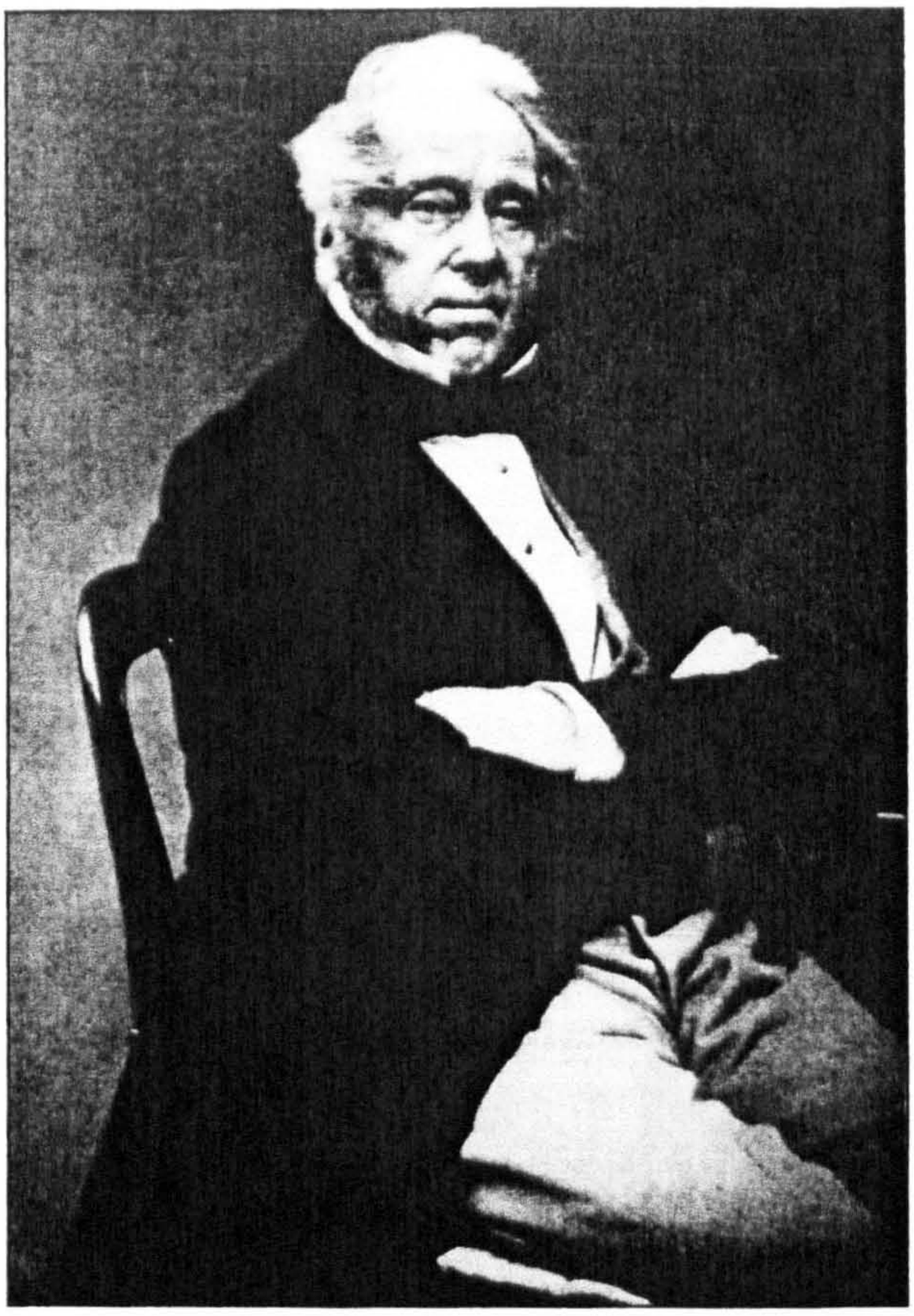
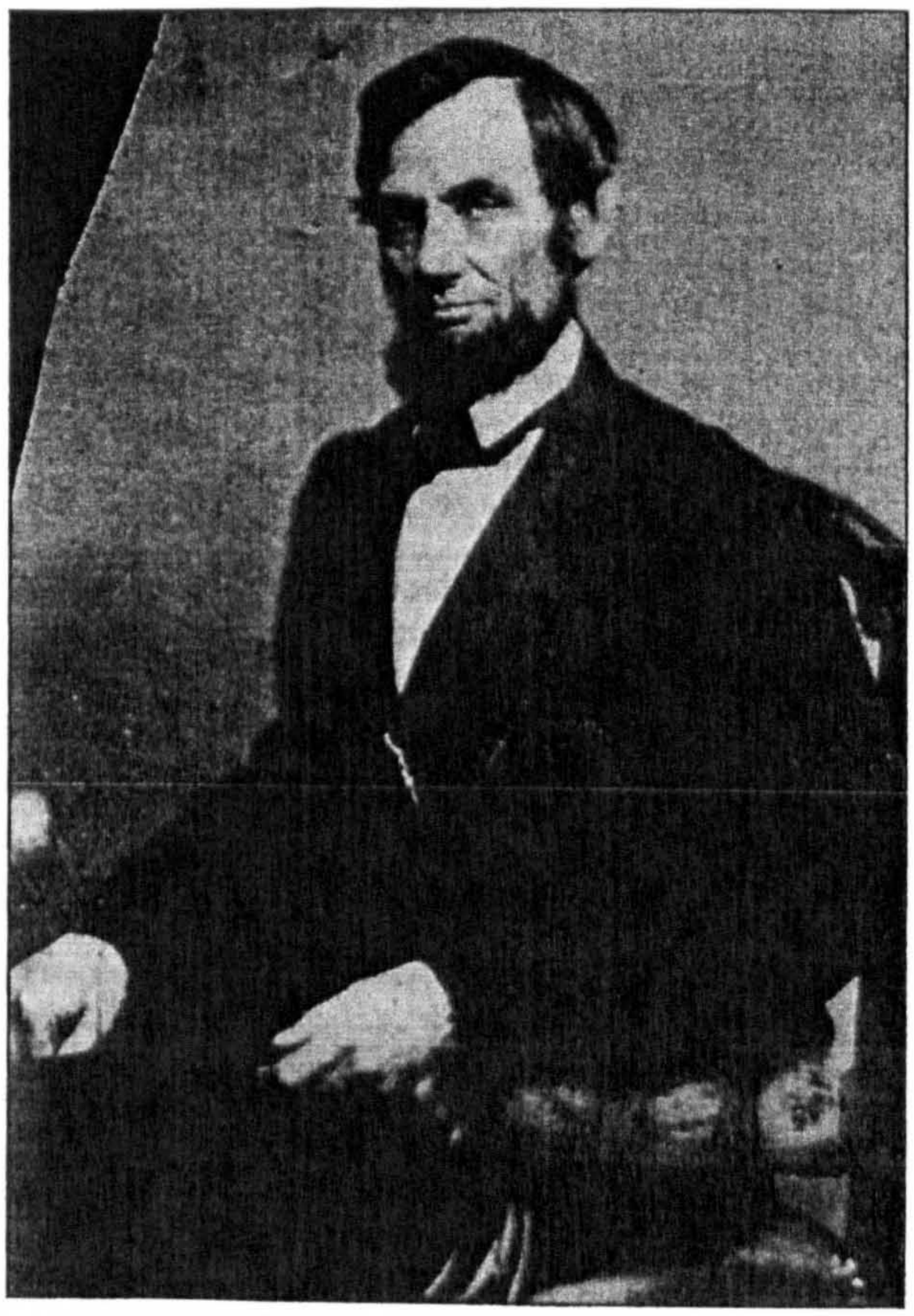
[30] Victorian navy Admiral George Ballard ruefully noted in his comprehensive study of Britain's "Black Battlefleet of 1870", for example, that "the strategic conception [of coastal defence] which left the initiative in movement to the enemy... retained at least sufficient official acceptance to absorb an annual and appreciable proportion of the national expenditure on new fleet construction," George A. Ballard (edited by G. A. Osborn and N. A. M. Rodger), *The Black Battlefleet: A Study of the Capital Ship in Transition* (London: Nautical Publishing Co., Lymington & the Society for Nautical Research, Greenwich, 1980), 218; yet Rear Admiral Raja Menon of the Indian Navy has observed that "the exertions of power abroad necessitates the domination of someone else's littoral," Raja Menon, *Maritime Strategy and Continental Wars* (London: Frank Cass Publishers, 1998), 184.



Henry John Temple,
3rd Viscount Palmerston

(from Jasper Ridley, *Lord Palmerston*)



Abraham Lincoln

(from Frederick Hill Meserve and Carl Sandburg, *The Photographs of Abraham Lincoln*)

emphasis Boynton makes is upon the *foreign* not the domestic potency of the Union Navy during the Civil War. Where is that discernment now?

Indeed, the entire purpose of the Union Navy, as Boynton saw it, was to guarantee national sovereignty against foreign enemies first, insofar as the Union army dealt primarily with the domestic rebellion of the Southern states. "With England and France," Boynton observed, "the most interesting question connected with our affairs has been, whether we could create a truly formidable Navy":

> Our naval strength was the standard by which they measured their power to attack, and ours to defend. They did not believe it possible for us to produce a Navy in a few months which could both seal up our long line of sea-coast and defy their most formidable ships, and this mistaken judgment was the main influence in deciding their policy in regard to American affairs. A history of the Navy, then, is a history of that power by which Europe gauges our national importance, and by which our rank among nations is assigned.[31]

History of the Navy during the Rebellion thus regarded the American Civil War as a contest of 'American' versus 'European' political and social values, and, "more than all else, the Navy has been an original creation, a true outgrowth of distinctive American thought...the embodying of truly American ideas; and whatever question there may be in regard to any other feature of our civilisation, no one will deny that there are American ships, American cannon, and an American Navy." National identity in this sense, its ironclads, "should be studied by the people," Boynton maintained, "because they show the originating and independent power of American mind, when operating on a large scale, and competing with the whole of Europe." Invaluable for its long forgotten insight, Boynton's obsequious (and perhaps ingratiating) portrayal of the U.S. Navy nevertheless suffers from partial resources, severe patriotic bias and the still widespread Anglophobia

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[31] Charles B. Boynton, *The History of the Navy during the Rebellion*, 2 vols. (New York: D. Appleton, 1867-68), 1: 6.

of the day. England, Boynton was sure, "desired, with an earnestness not exceeded by that of Jefferson Davis himself, the humbling of the North, and the separation of the Union."[32]

As a result, many questions remain. Had Britain fully "desired the separation of the Union" would the course of her naval construction been altered? What effect did the ironclad naval race with France—before the outbreak of the war in America—have on British policy? If national protection and deterrence of foreign intervention in the Civil War, if not outright preparations for a worldwide maritime war against the British Empire, were guiding principles behind the rapidly mobilising United States Navy, what was the basis for British national and imperial doctrine? These questions were frequently asked by opposing members of Parliament, for they were deterministic of what naval power meant itself. The Admiralty spokesman, Lord Clarence Paget's reply was that in determining Britain's ironclad shipbuilding policy "one could not advert to the subject without more or less dealing with foreign nations, and especially with France."[33] In other words, power was a *relative* concept. Boynton's comparison of Union and British naval means (surprisingly limited given his main argument) would have benefited by also examining the evolution of Britain's ironclad program, instead of proceeding with a narrative of the American Civil War. Subsequently, it might have contributed much more satisfactorily to an appreciation of American, if not British, predominance even in the absence of actual campaigns and battles. As such, this thesis picks up where Boynton, not Baxter, left off.

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[32] Boynton, *History*, 1: 14-15; also 56-8, 91-2.
[33] 4-4-1864, *Hansard*, 431-2.

PART ONE

Deterring the Union: British Naval Supremacy

I. An ironclad race with France

It is important to remember that the British ironclad program only began as a response to the establishment of the French ironclad fleet of Napoleon III. Until 1858, Great Britain held a precarious edge in screw-propelled, steam-powered wooden-hulled ship-of-the-line.[34] As the lead was looking to be decisively in favour of the Royal Navy once more, the French ironclad *Gloire* seemed to change the rules again.[35] Following the evident success of the *Gloire* design—and concept—the French added to the ironclad's sisters still under construction with an announcement of a program for an entire fleet of ocean-going iron-plated warships. The sheer scale of the program, so quickly engineered by the talented naval architect and head of the French Ministry of Marine, Dupuy de Lome, and decisively endorsed by the Emperor himself, suddenly made the British response of the *Warrior*-class— vessels superior in virtually every aspect of sea-keeping, powerfully armed and strongly protected—seem inadequate. The Board of Admiralty, headed by Edward Adolphus Seymour, the 12th Duke of Somerset, under Lord Palmerston's (Henry John Temple, 3rd Viscount) new 'Liberal Coalition' government (1859), met in early 1861 to discuss the urgency of a full-scale response.[36]

The immediate nature of the threat to British security was apparently that of invasion. Coupled with the massive fortification and modernisation of the strategic port of Cherbourg, it was obvious to the naval members of the Board that "immediate steps should be taken to meet so formidable a force—otherwise the spring of 1862 might see the French in possession of such a fleet of iron cased ships as could give them the

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[34] ADM 1/5765, 23-2-1861, *Navy Ships Building, &c.: An Account, showing the Expenses incurred on Her Majesty's Ships Building, Converting, Repairing, Fitting, &c., during the Financial Year 1859-60*, lists £1,018,061 expended for "Ships and Vessels building", most of these for sailing ships still converting to screw, either before or after launching. Ironclad ships are not listed.

[35] Hamilton, *Anglo-French Naval Rivalry*; see Chapter 3 "Anglo-French Diplomacy and the Transition from the Screw-Liner to the Ironclad, 1854 Onwards".

[36] ADM 1/576, minutes dated 13-1-1861. J. P. Baxter surmises 13 February as the more likely date of this minute, given the reference to a Foreign Office report dated after, *Introduction*, 171, ff.

command of the Channel."[37] This was not a politically-calculated alarmist sentiment, but a cool appraisal of fact.[38] To the professional Navy, in a war with France or not, such a likelihood was embarrassing and unthinkable.[39]

In January 1861 the Controller (formerly 'Surveyor'), Admiral Sir Baldwin W. Walker, presented designs to the Board for what was to be the new *Valiant*-class of broadside-ironclad. Taking into account the public as well as professional criticisms of the *Warrior*-class, and the two successor broadside-ironclads of considerably smaller dimensions, *Defence* and *Resistance* (280' length; speed 11.228 knots for *Defence*[40]) the new ship was "proposed to place 30 of the guns on the Main Deck, which is to be protected by Armour Plating from end to end."[41] This would give the new *Valiant* and *Hector* substantially more protection than the unarmoured ends of the first four broadside-ironclads, *Warrior* and *Black Prince*, and *Defence* and *Resistance*, whose limited armour belts protected barely half of their long batteries.[42] Yet even while the battery itself was now to be fully protected, the waterline protection was still less than complete, being "within 30 ft of the Stem, and 35 ft of the Stern Post" five feet below the load waterline.[43] If the ships heeled or rolled during action and suffered a penetrative hit in this unprotected stretch of 65 feet, the consequences could instantly be disastrous. If they did not sink, they could be seriously crippled.

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[37] ADM 1/5765, 13-1-1861.
[38] Andrew Lambert, "Politics, Technology and Policy-Making, 1859-1865: Palmerston, Gladstone and the Management of the Ironclad Naval Race," *The Northern Mariner*, Vol. III, No. 3 (July 1998), 9-38.
[39] And unjustifiable; as Oscar Parkes notes, "[Palmerston] was one of Sir Howard Douglas's disciples, and in consequence work on the wooden line-of-battle ships was speeded up so that our old superiority in these could be regained, and a Two-Power standard in them assured by 1861. And this in the face of the knowledge that the French had not laid down a wooden ship-of-the-line since 1855!" *British Battleships*, 14.
[40] Ballard, *Black Battlefleet*, 241, 247.
[41] ADM 1/5774, 10-1-1861.
[42] This weakness was presumably compensated by numerous water-tight compartments which could be flooded in the case of shell penetration damage. While the *Warrior*, for example, was to gain only(?) 26 inches more draught, the corresponding loss in speed and manageability to such long ironclad ships with their ends flooded made this safeguard extremely unattractive. See Brown, *Warrior*, 14, for increase in draught.
[43] ADM 1/5774, 10-1-1861.

This was not the only disadvantage. By increasing armour protection over the first four broadside-ironclads, Walker warned "it will scarcely be questioned that this amount of security against injury from Shot and Shell is not to be obtained without compromising important qualities of sea-going ships." The added weight towards the ends of the ships would contribute to heavy pitching at sea and thus make them "unsuited for general service," (as was yet to be tested for the *Warrior*.) Furthermore, "from their comparatively larger amount of Armour Plating, they will approximate much more nearly to that of the 'Warrior' class than their relative tonnage would appear to indicate."[44] This was considered a move more towards coastal defence than otherwise, despite the immediate tactical improvements in design. The *Gloire*, however, already incorporated a fully protected battery and was as fast as the *Valiant*-class, which in turn was slower than *Warrior*'s fourteen-knot maximum under steam by two knots.[45]

If the Board expressed alarm at the French ironclad program, it is significant that these statements came *after* the designer of the *Warrior*, Chief Constructor Sir Isaac Watts, had provided the Admiralty with improved *Warrior*s in the form of the *Achilles*; and only two weeks after the *Valiant*-class submission was approved. Some of the original problems with the first four ironclads were solved in the new design. An iron ship—and the first to be constructed in a Royal Dockyard (at the newly re-facilitated Chatham)[46]—the *Achilles* was armoured entirely along the waterline, with modifications which saw to the protection of the rudder and steering gear; dangerously exposed on the preceding ironclads. As with the first ships, little more than half her bulwarks and battery were covered by the armour plating at first; within a year all the unprotected guns were removed. But the *Achilles*' full armour protection (4½-inches of wrought iron plating on

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[44] *Ibid.*
[45] Parkes, *British Battleships*, 30.
[46] Brown, *Warrior*, 15.

18-inches of teak, identical to *Warrior*'s), combined with the need for speed and sea-worthiness, again produced an ironclad as long as the *Warrior*, with a gigantic spread of sail 30,133 square feet carried in four masts and a bowsprit (later reduced to three masts). Speed was comparable, yet the draught exceeded *Warrior*'s at 27½-feet. This stupendous warship was a Victorian overkill, if the original concern of the Board was better actual protection for this most expensive naval investment, especially when the length of time involved in its construction, given the unforeseen problems occurring with the other ships, meant that Britain herself was vulnerable longer. When an ironclad of this reasoning was finally produced its armour was no longer superlative but inferior, and the problem of where to station these ships even in home ports remained. Nor did the new broadside monster solve the problem of sheer handiness in combat, especially in close quarters such as harbours or inlets. If the issue of armour and armament was forefront in the mind of the Controller, as was sea-keeping, the capacity for coastal defence was growing by comparative leaps and bounds. But under Walker's direction at least, the emphasis was more upon sea-keeping than full protection and powerful armament. His resignation shortly afterwards did little to encourage the Board or the public that the French threat was properly met.

On the 2 May 1861 the new Controller, Rear-Admiral Robert Spencer Robinson, recommended the testing of armour plates on the plan of Mr. Charles Lancaster, who boasted of his ability "to deliver any quantities of such Plates so manufactured, of any thickness up to ten inches."[47] The following day Robinson wrote to the Admiralty "it would be very advantageous to erect the Frames of such of these [line-of-battle] ships as are nearly completed, with a view of preparing them for 50 Gun Frigates to be covered with Armour plating..." Surplus wood supplies in the dockyards could thus be taken care of, and "If from any cause a pressing necessity should arise for a Force of this

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[47] ADM 1/5774, 2-5-1861.

description, a great proportion of the work will be already done...and time will have been gained for any further experiments on the combination of wood and Iron which it may be desirable to make.[48] This next step, the introduction of the wooden-hulled conversions of the *Royal Oak*-class, was regarded as an improvement on the *Valiant*-class, with a fully protected battery (and along the waterline), but not so much in terms of range as the *Warrior*, for his submission added only that "she would be a sufficiently good Sea Boat to go to the Mediterranean if required...."[49]

However, with wooden hulls, the ships of this class could be seen as more free ranging in that there was no worry of excess fouling. Although the main theatre of naval operations for France was more likely to be the Mediterranean, this was also a factor in the French decision to proceed with Dupuy de Lome's first ironclads—which capitalised more on French strengths and relied less on comparative French weaknesses, such as iron ship manufacture.[50] What did it matter that wooden hulled ships would not last as long as iron-hulled ones, when advances in armour, ordnance, and engineering made it painfully obvious that the new warships would be obsolete within years, not decades? The Controller toughened his proposal by remarking "it is needless to call their Lordships' attention to the fact that every maritime power in Europe is advancing in this direction, and that unprotected wooden ships cannot contend with success against their iron coated rivals, and I confidently submit for their Lordships' consideration that we should not neglect this means of preparing for a conflict, which though we may not seek it, may yet against our will be forced upon us."[51] Thus, the decision to initiate the *Royal Oak*-class of broadside-ironclads was influenced more by the need to utilise existing wooden ships still under construction from the previous government's building program—increasingly

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[48] *Ibid.*, 8-5-1861.
[49] *Ibid.*
[50] Hamilton, *Anglo-French*, 92-8.
[51] ADM 1/5774, 8-5-1861.

regarded as a liability in a naval action against French ironclads. Conversions saved time and money.[52] It also made the most of government resources while the private firms struggled with iron-hulled ironclads already on order.

Robinson increased the pressure for these conversions (which also satisfied the earlier need of the Board) as a means simply to increase numbers. His "Table of French iron-plated Ships", dated 21 May 1861[53], identified sixteen French ironclads built, launched, or under construction, as well as a further eleven floating batteries (including the five constructed for the bombardment of Kinburn in 1855).[54] Though the five Royal Oaks would be "in every way inferior for all the purposes for which we require a Ship of War, to Ships of the 'Achilles' class, built of Iron and with those modifications in Plating &c. which we are prepared to make", nevertheless it was "so important…to have some Ships constructed to meet the Navies of other Powers at least on equal terms, that, rather than be without such Ships…not as the wisest, nor as the most economical, nor as the safest way of meeting the exigencies of the case, but because…other considerations make this plan the only practicable one at the present moment…"[55]

These comments were directed to the cautious policy of experimenting with the new technologies carefully before fully committing to one design. Somehow, a superiority in individual ship design was gained (with the *Warrior*-class, and the improved *Achilles*), but the collective ironclad force soon to be at Britain's disposal was markedly less than that of France. The issue was more complex than which sea-going ironclads would

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[52] ADM 1/5840, 25-3-1862, notes the original estimate price per ton for *Warrior* as £31.5, the actual cost at £41.67 per ton; while the *Black Prince* contract estimate at £37.25 per ton rose to £39.78. These figures were later adjusted to: *Warrior* final rate per ton £42.25; *Black Prince* £41.57. The *Warrior* cost £239, 646.01 (ADM 1/5802, *op. cit.*, "Iron-Cased Ships—Statement of Cost", 25-3-1862, No. 408.) The cost for the improved *Warrior*-class, the *Achilles*, laid down on 1-8-1861, was estimated at the time at £354,410 (ADM 1/5774, "Drawings for Iron-cased Ships".) J. P. Baxter notes a final cost of £444,380, when she was finally completed for sea on 26-11-1864, *Introduction*, 167.

[53] ADM 1/5765, 21-5-1861.

[54] Baxter, *Introduction*, 69-91.

[55] ADM 1/5765, 22-5-1861.

counter the French ones best, or how many ironclads of what degree of greater or lesser armour protection or speed would be required. Intertwined with these deliberations was the growing certainty that strategic superiority represented more perfectly by the *Achilles* and the *Warrior*-class did not necessarily equate with the tactical advantages innate to smaller, more numerous ironclads, even wooden-hulled conversions such as that of the *Royal Oak*-class, or the grander imperative which made the best use of the nation's existing industrial and maritime resources. The right balance still had not been reached, and the Royal Navy seemed to be losing the race.

The Admiralty again considered its options. Along with Robinson's expedient of the *Royal Oak*-class, the growing concerns of armour protection and armament still rested on the one principle linking the two. The best armour scheme was the *Warrior*'s, which, at 4½-inches was equal to the first-generation French ironclads.[56] In regards to armour, therefore, it was a question not so much of thickness, but *coverage*; protecting more of the ship's armament with nothing less than the proscribed arrangement, an increase in area not volume. Similarly, the 68-pounder muzzle-loading smoothbores and the breech-loading 110-pounder rifled Armstrong guns were seen in the spring of 1861 as the heaviest naval ordnance available. Greater armament still implied weight of broadside. To increase this aggregate sense of firepower, improved ironclads had to mount more guns—not fewer guns of an even heavier calibre. The logical consequence of this principle would be the *Minotaur*-class ironclads, "the longest and largest single-screw fighting ships ever built, and the heaviest in the Navy for the next ten years, uniquely favoured in a rig which comprised the spectacular array of five masts..."[57] These ships represented the 'second generation' phase of the British ironclad program, and would

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[56] ADM 1/5774; on 7-5-1861 Robinson reported to the Admiralty his criticisms of an ironclad fully belted with solid seven inch iron plating, but with no wood backing—plans of which were being prepared for the Russian government by the British iron shipbuilder J. Samuda.
[57] Parkes, *British Battleships*, 60.

quickly prove the most problematic in terms of construction, cost, practicality, and obsolescence. Referring back to the 13 January minute, the High Commissioners of the Board of Admiralty recited to the government on 23 May 1861 the progress of French ironclads:

> ... Fifteen Iron cased sea going Frigates of the First Class including two, rated as ships of the line which are either in commission afloat or plating, in process of building or ordered to be commenced immediately.
>
> 1 in Commission
> 1 afloat-plating
> 1 afloat, engines finished
> 1 ready for launching
> 2 nearly ready for launching
> 8 laid down this year
> 1 named-not laid down
> 15 total[58]

Against this the Admiralty could only offer "two Frigates of the First Class afloat and plating. [in margins: *Warrior*, *Black Prince*, 46 guns each]...Two of an inferior class afloat and plating. [*Resistance*, *Defence*, 22 guns each]...Two of a superior class the tender of which was accepted in the end of January last [*Hector*, *Valiant*, 32 guns each]...And one of the First class the keel of which is not yet laid [*Achilles*, 50 guns], making a total of seven afloat building and ordered." It was therefore a matter "of urging on Her Majesty's Government the necessity of adopting immediate measures for the construction of iron plated vessels of the first class with such improvements as experience has suggested," and "to ask for authority to call for tenders for new iron cased ships from the private trade as well as to employ additional hands in building and converting wooden ships to carry armour, being convinced that none but the most vigorous and energetic

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[58] ADM 1/5765, 23-5-1861.

measures will prevent the command of the Channel at an early date falling into the hands of the French Emperor."[59]

However, it was the First Lord's candid and direct analysis of the 'best plan' on the same day, which correctly observed: "One great difficulty in deciding upon the best mode of effecting this increase [in numbers of ironclads] has arisen from the uncertainty in which we still remain as to the construction which should be adopted."[60] Three choices now presented themselves. The first was to cut down existing screw ships-of-the-line or frigates and cover their sides with 4½-inch armour plates. It was the fastest and cheapest plan. Nevertheless "these vessels would…not be sea-going ships, they would be equal to the floating batteries building in France, but inferior to the frigates now laid down," and Somerset immediately concluded that "unless therefore there should be the apprehension of an immediate necessity for defensive preparations, this course appears to be unadvisable." The next possibility was that of the *Royal Oak*-class; proceeding with existing frames in Royal Dockyards which would allow for greater control during completion (including lengthening) and a more integrative finished product. Less expensive than new iron ships, they would "probably be equal to the French plated ships," but their wooden hulls would not last, and, ever mindful of public criticism, the First Lord noted "they will be inferior to the *Warrior* type, and will be justly considered as indicating a retrograde movement rather than an advance in ship-building."

The third alternative was "to apply to the Treasury and propose a supplementary vote to Parliament with the intention of constructing five or six iron-ships to be plated according to the system which the Controller and the practical officers of his department now approve." This was to be an improved *Achilles*-class, the *Minotaur*. But exclusive to the

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[59] *Ibid.*
[60] *Ibid.*

Minotaur-class was the introduction of a new armour scheme which called for thicker plates, now 5½-inches, backed by only 10-inches of teak to account for the greater weight in iron. As serious as the fact that the new combination was untested was the implication that all previous armour-protection arrangements were inadequate:

> The objections to this course are chiefly financial and political. While the navy estimates amount to twelve millions it would be necessary to review carefully every source of expenditure before applying for an increased outlay under the head of iron-ships. It would reasonably be said that until the *Warrior* had been tried at sea, such a demand was preposterous, and that if we condemn the construction of the *Warrior* before this vessel has even been tried, Parliament may fairly refuse to entrust the board with means of making new experiments at such a cost.
>
> The political objection would be equally strong as such an application to Parliament would be ascribed to some new distrust, at a moment when a good understanding with France may most usefully tend to the removal of difficulties in our relations with the United States.[61]

Somerset's political message was overlooked. The Board's minute re-emphasised the danger of French naval power, not the manipulation of it. Thus, despite the initiation of two smaller improvements of the first four partially protected broadside-ironclads, a more protected version of the *Warrior* that was to lose none of its essential sea-going qualities, particularly its speed, and four immediate wooden-hulled conversions (to be named *Royal Oak*, *Prince Consort*, *Ocean*, and *Caledonia*), the Admiralty eventually decided upon the construction of three (rather than six) more large iron-hulled broadside-ironclads as a response to the perceived threat from France.

The British ironclad program was a mixed choice. Four of the ironclads were slower than the rest, and two of these, the *Defence* and *Resistance*, were already considered 'inferior' before completion. By March 1862 the Controller would report "the sum that the Firm

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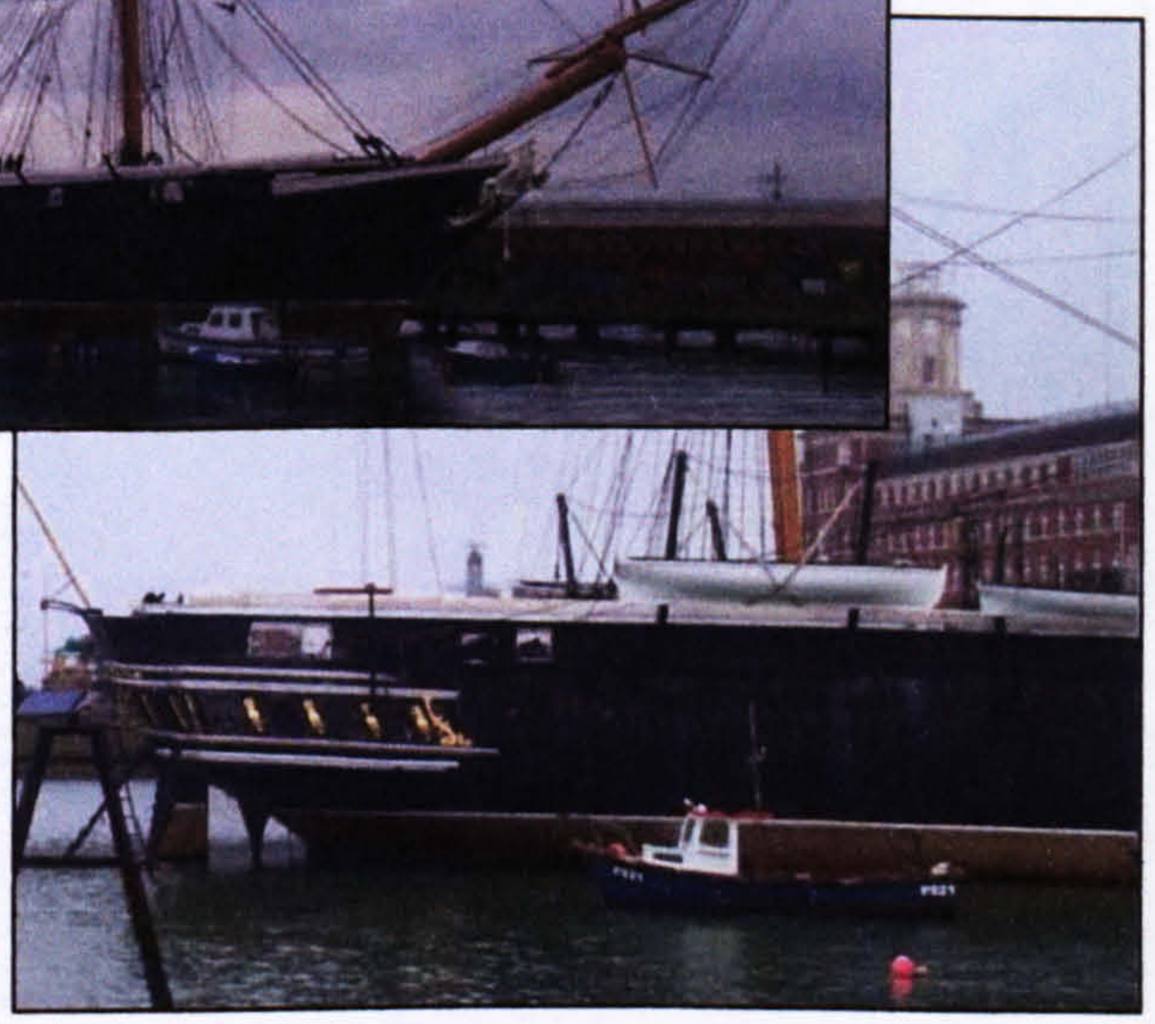
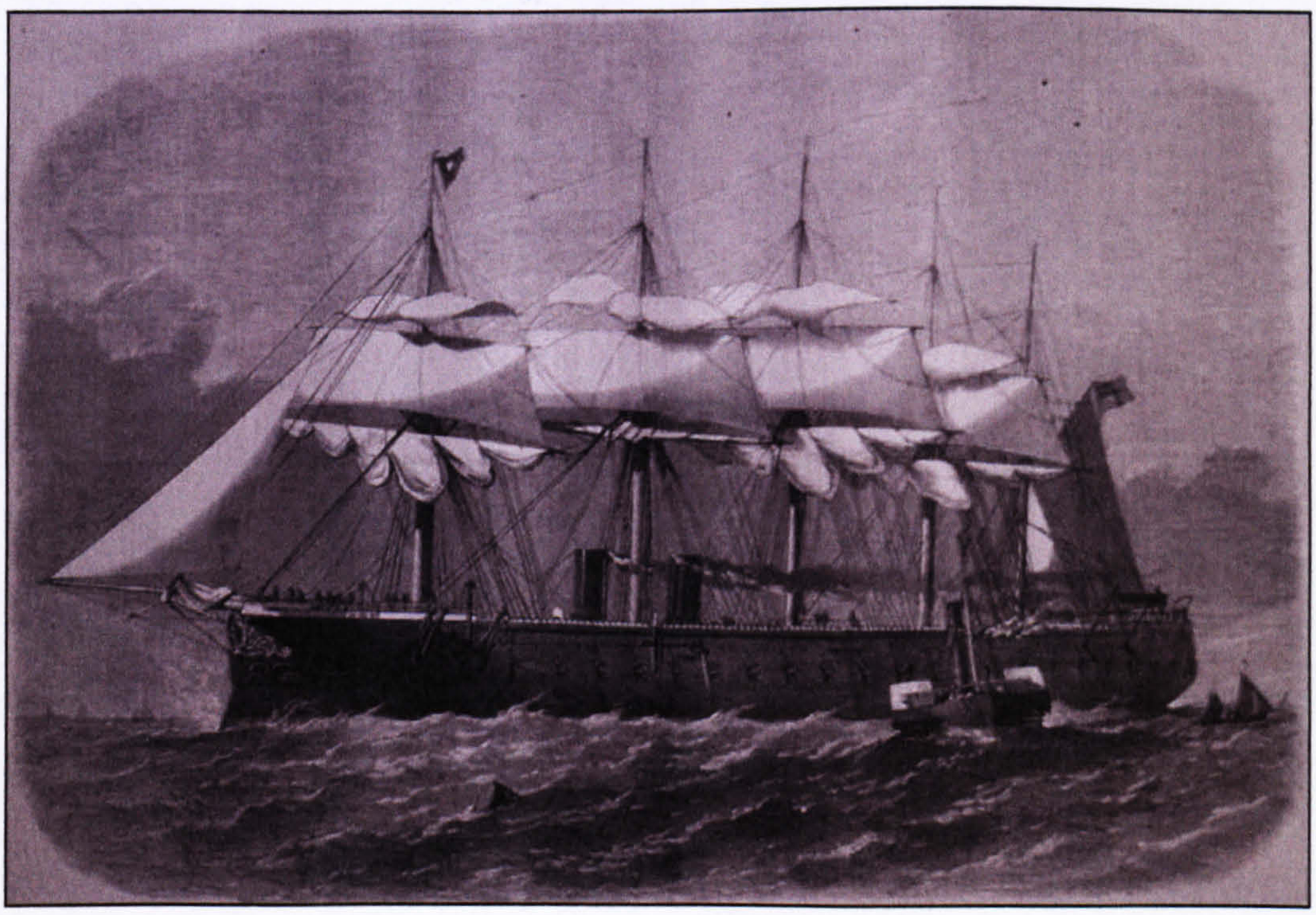
[61] *Ibid.*



The magnificently restored H.M.S. *Warrior*, now at Portsmouth. She was the world's most revolutionary warship by 1861; only against her can the *Monitor*'s own radical innovations be appreciated. (Right) Note the exposed rudder head. (Author's collection)

H.M.S. *Minotaur*, *Illustrated London News*, 8-4-1865



[Westwood and Baillie] may be considered as having paid exactly out of Pocket for building the *Resistance* amounts to £157,972.11.02," and that the Admiralty "will have paid...a sum of ten thousand pounds beyond what they were strictly entitled to by the terms of the Contract." [62] Of the fourteen ironclads built, building or approved to be contracted for by the summer of 1861, ten were iron-hulled, but these were broken down into five different classes, two of them smaller and slower than the rest, each with their own armament and armour configuration—making a comparative representation of their fighting abilities tedious. As a result, confusion plagued the intended purposes of these ships, whether as coastal defence vessels, ships to operate in an open sea line-of-battle, or simply to 'command the Channel'. It may well be argued that this variety of ironclads *built within the same period of naval ordnance and armour advances* was in fact an asset to the Royal Navy, whose duties stretched from the global to the immediate vicinity of the British Isles. However, there is no indication that this would be anything other than an exercise of justification in hindsight, since there is very little discussion as to exactly *how* vessels other than ironclads built expressly for coast defence were to actually defend the country. As the French ironclads were intended to dominate any wooden warship they may encounter at home or abroad, it can only be assumed that the British ironclads were projected to overwhelm those of the French wherever they may be encountered. If the *Defence* was a failure at sea, its ability to fight in more sheltered waters was no less and probably more than that of the *Warrior*. If the primary concern was for the defence of the Channel—or Mediterranean trade routes to India—then trans-oceanic ironclads were a violation of the principle of consolidation of force. The heart of the problem was that the proper ironclad simply was not found in either the first or second generation responses to first, the French threat, to armour-plated challenges emerging from the rest of Europe, and then to the danger of entanglement in the American Civil War. There is no other reason to explain the *Defence* and *Resistance* without referring to cost-effectiveness and the

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[62] ADM 1/5802, 6-5-1862.

limited, not extended, operationability of the *Warrior* and *Black Prince*; while the *Valiant* and *Hector* continued this criticism by adding more armour protection in place of speed. To regain speed and range and yet add more protection, the *Achilles* took the Royal Navy back into a state where some of its ironclads were better than any existing French design in all these respects. Even so, this did not solve the initial problem of superior numbers, and by gambling more, not less, in the taxing production of a few 'super' broadside-ironclads the Admiralty committed itself to the hope that well before these vessels were even launched, potential enemies would not develop guns powerful enough to pierce their long thin sides or armour thick enough to make the fire of so many guns as meaningless as the broadsides poured into the C.S.S. *Virginia*. As the *Achilles* was not launched until December 1863—or the first of the *Minotaur*-class, the *Minotaur*, though launched in the same month, was not commissioned until April 1867—this calculation proved to be unrealistic within months. It was the need for a practical solution to the immediate, if not geo-strategically proximate, threat posed by Napoleon III's decision which motivated Spencer Robinson to suggest the 'retrograde' *Royal Oak* conversions, all of which were launched before the *Achilles*. At a stroke the continued production of vulnerable first-class wooden men-of-war was replaced with such vessels clad in iron, without exceeding the naval estimates. Indeed, it was the new First Naval Lord Sir Frederick Grey's opinion, in a letter written to the Commander-in-Chief of the Atlantic Station, Vice-Admiral Sir Alexander Milne, shortly after her completion that "the *Royal Oak* is the best of the whole..."[63] This was fortunate, since the race with France left the British Empire partially protected.

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[63] 12-6-1863, Sir Frederick Grey to Milne, MP.

II. Industry and conversion problems

Work on the next generation of British ironclads proceeded with all available resources at hand. Great Britain's economy was strong, but the social system was crying out for reform which naturally interfered with large naval estimates and appropriations.[64] While much of the populace supported the notion of unquestioned naval mastery over France or any other power—indeed, the lore of the older generation demanded it—the price involved was such that 'wooden ships and hearts of oak' could not suffice in the Industrial Age. Taxation was for every income more real, generally, than patriotism and world prestige. It was an inconvenient time, when the Empire was "happily at Peace with all Sovereigns, Powers, and States,"[65] for an expensive, technologically-bold naval arms race with Britain's nearest and most dynamic continental neighbour. For every ironclad the French emperor was prepared to lay down, the Admiralty felt compelled to answer.[66] Furthermore, if the threat took the form of ocean-going ironclads, the form of the British response was virtually pre-decided as well.[67] Already the Royal dockyards were filled to capacity working on the completion of the unarmoured steam ships insisted upon in the previous administration (to meet the earlier deficit acquired in steam ships-of-the line against France, and to surpass it again unquestionably) in addition to the new ironclads.

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[64] See Bernard Semmel, *Liberalism and Naval Strategy: Ideology, Interest, and Sea Power during the Pax Britannica* (Boston: Allen and Unwin, 1986); also Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (London: Fontana Press, 1988), 193-203.

[65] ADM 1/5765, *Proclamation by the Queen* [on American Civil War neutrality], 13-5-1861.

[66] Palmerston himself observed famously, on the question of a pre-arranged naval arms limitation treaty with France—and the British addendum for twice the number of French ironclads—discussed in Parliament in July 1861: "the Emperor would laugh at us and say 'By all means! I must have 20 or 24 Iron-cased ships—you are quite welcome to have 40 or 48, and I hope you will find the money to build them; but do not expect that I am to sit with my hands crossed till you have done so!' ", Parkes, *British Battleships*, 49.

[67] Hamilton, *Anglo-French*, "The extent of the failure of British naval-war planning suggests that more was involved than any simple Admiralty failure to cope with the implications of technological change. Some basic failure was involved, a failure whose main symptom was an excessive degree of copying...The fact that the French navy acted in a particular way was all too often a sufficient incitement for the Royal Navy unthinkingly to follow," 140.

There can be no denying that the pace and scale of industry was tremendous. While Lord Lyons (Richard Bickerton Pemell), Britain's minister to the United States, informed Vice-Admiral Milne of the hostile reaction in Washington to the Queen's Proclamation of Neutrality to the rising war between the Northern and Southern states, and warning him the Federal government was unlikely to "abstain from provoking language or even aggressive conduct," the Admiralty Controller was noting ten-hour days starting at 6am for workmen, Monday through Saturday in the Deptford yard.[68] Two days later on 14 June 1861, Robinson objected to the request to assign steam gunboats for the training of Royal Navy volunteers and the crews of Coast Guard ships, as "no serious interruption of all the proposed works in the Dock Yards and factories will be occasioned."[69]

The need for consolidating resources was understandable even given the size and demands of the pre-existing Royal Navy. Perhaps in response to Lyons' letter to Milne, forwarded by the Foreign Office, the Admiralty directed the Controller the following day (12 June) to comment on their historic memorandum abolishing the historic Sailing Ordinary as it merged into the new 'Steam Reserve'. Robinson prescribed "in the First Division of Steam Ordinary at each Port a Line of Battle Ship, a Frigate, a Corvette, a Sloop, a small vessel, and a Paddle Wheel Steamer," a considerable force, with three other Divisions behind it, in addition to the vessels actually in commission.[70] In March 1862 he counted thirty-nine Corvettes afloat alone, with the Royal Navy categorised into Line-of-Battle Ships, Frigates, Corvettes, Sloops, and Gun Vessels and Gun Boats of the 1st and 2nd Class, while "the Paddlewheel Steam Ships should be divided into Frigates, Sloops, Despatch Vessels, and Small Vessels."[71] Ironclad warships are not mentioned, but they were in fact at the top of the list in power and priority. The Parliamentary

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[68]ADM 1-5767, 6-11-1861, enclosed 25-5-1861, Lyons to Milne; ADM 1/5774, 12-6-1861.
[69] ADM 1/5774, 14-6-1861.
[70] ADM 1/5766, 8-7-1861.
[71] ADM 1/5802, 3-12-1862.

Expense of Ships in 1861-1862[72] recorded a labour and materials total of £932,323 for "Ships and Vessels built or building by contract, or purchased", next to the £1,003,047 paid for all "Steam ships and vessels fitting out, refitting, repairs and maintenance in commission and reserve". Of the 25 ships of private construction subsequently registered only 18 are armed and of these 9 are ironclads:

Name of Ship + Contractor	**Guns**	**Tonnage**	**Where built or building**	**When laid down**	**Total Expenditure on each Ship to 31-3-1862**	**Remarks**
Agincourt J. Laird, Sons & Co.	50	6,621	Birkenhead	30-10-1861	12,352	
Black Prince Napier & Sons	40	6,109	Glasgow	12-10-1859	322,239	Launched 27-2-1861
Defence Palmer, Brothers & Co.	16	3,720	Jarrow, Newcastle	14-12-1859	209,075	Launched 24-4-1861
Hector Napier & Sons	32	4,063	Glasgow	8-3-1861	157,285	
Minotaur Thames Iron Ship Building Co.	50	6,621	Blackwall	12-9-1861	18,847	
Northumberland C. J. Mare & Co.	50	6,621	Millwall	10-10-1861	8,905	
Resistance Westwood, Baillie, Campbell & Co.	16	3,710	Poplar	21-12-1859	213,047	Launched 11-4-1861
Valiant Westwood, Baillie, Campbell & Co. +Thames Iron Ship Building	32	4,063	Poplar	1-2-1861— and then 24-2-1862	119,911	
Warrior Thames Iron Ship Building Co.	40	6,109	Blackwall	25-5-1859	328,453	Launched 29-12-1860
TOTAL					**1,627,198**	

Listed separately from "Ships and Vessels building in Her Majesty's Dockyards" are those "Ships, commenced as wooden ships, converted into iron cased vessels while building", the five emergency expedients of the *Royal Oak*-class:

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[72] ADM 1/5862, *Annual Account of Expense of Ships, 1861-2... ordered to be printed 14 April 1863.*

Name of Ship + Contractor	Guns	Tonnage	Where built or building	When laid down	Total Expenditure on each Ship to 31-3-1862
Caledonia	34	4,125	Woolwich	1-10-1860; conversion 6-6-1861	70,248
Ocean	34	4,045	Devonport	23-8-1860; 3-6-1861	74,999
Prince Consort (late *Triumph*)	34	4,045	Pembroke	13-8-1860; 6-6-1861	103,969
Royal Alfred	34	4,045	Portsmouth	1-12-1859; 22-6-1861	94,113
Royal Oak	34	4,056	Chatham	1-5-1860; 3-6-1861	112,166
TOTAL					**455,495**

Perhaps more indicative of the level of dependency upon private contractors which the Royal Navy found itself during the beginning of its ironclad program is the fact that of the 68 ships listed under construction in Royal Navy yards, only the *Achilles* is armour-plated.

Name of Ship	Guns	Tonnage	Where built or building	When laid down	Total Expenditure on each Ship to 31-3-1862	Remarks
Achilles	30	6,079	Chatham	1-8-1861	62,921	Building in a dock.

The remaining £2,761,198 expended on ships constructing in Her Majesty's Dockyards included 10 of 89 guns or more (such as H.M.S. *Howe*, 121 guns, laid down in Pembroke, 10 March 1856, and launched 7 March 1860), 9 of 51 guns, 3 of 36 guns, 4 of 22 guns and 2 of 21 guns. This was still £1,371,084 more than expenditures made to private contractors for ironclads, but this was for 67 warships as opposed to 9, whose costs were increasing in most cases well beyond their contracts.

The contract tenders for the three broadside-frigates of what was to be the *Minotaur*-class, originally the *Alexander*, *Dictator*, and *Invincible* (awarded to Thames Iron Shipbuilding Co., C. J. Mare & Co., and J. Laird, Sons & Co., respectively), specified a £5,000 penalty if the ships were not completed for the Navy in time. None of the estimates for the construction of the six new iron-hulled ironclads submitted to the Controller on the last day of August 1861 exceeded 24 months, and in the case of Thames Iron, the price per ton of £48.10.0 would rise to £50 if the armour plates themselves were made elsewhere, in addition to three extra months. The Board did not necessarily accept the cheapest estimate, for in addition to quality of construction and completion time there was the factor of the actual likelihood of firms already committed to government, commercial and foreign orders meeting their obligations successfully. The experience of the previous ironclad ships increasingly cast doubt on this prospect. Although Robinson ranked the south London Mare & Co. fifth in the list of "character and experience of the Parties and therefore their fitness to be employed in building Ships of this Class, irrespective of price" and Glasgow's Napier & Sons third, the Admiralty replied it did not "consider it advisable to give another contract at present to Messr. Napier until the *Hector* is further advanced."[73] This was despite the enclosed letter from Napier which explained "although the completion of the *Black Prince* has occupied considerably more time than was anticipated—in consequence of the details of that Vessel being of an unusual nature and new to us & and also to your Inspectors—who often could not give us the information we required, when wanted to continue the progress of the work uninterruptedly, and thereby, besides the delay, leading us into much extra expense—yet, from the experience Inspectors and ourselves have now acquired, we feel confident that, with the proposed new Vessel, we should be able to make rapid progress…"[74]

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[73] ADM 1/5774, 31-8-1861.
[74] *Ibid.* Enclosed letter dated 30-8-1861.

The lack of confidence also worked the other way. Aside from noting the presence of government inspectors in their shipyards, Napier (and Wigram & Sons of Blackwall) acknowledged Robinson's Item 4 proviso of his 5 August bid for tenders which stipulated "the Admiralty are to be at liberty to alter the arrangement of the Plating within three months from the date of the Contract without additional charge."[75] It was, after all, the business of these major firms to know of the navy's growing predilection for modifying the construction of its new iron ships up until the last possible moment based on any ordnance advances or armour plate test findings. On 5 September the Admiralty re-considered the names of the ships themselves in browsing through the Navy Signal Books. *Dictator* became *Northumberland*, recalled as the ship which received Napoleon I in 1815; *Invincible* turned to *Captain* and then to the more politically explicit *Agincourt*, and *Alexander* turned to *Audacious* which, being criticised as "always used in a bad sense," then became the *Elephant*—a name that suggested itself, perhaps, not so much great size and power as clumsiness—and was later turned to *Minotaur*.[76]

As Thames Iron accepted the challenge for its second great ironclad construction, it petitioned the Admiralty for the financial losses incurred "two years and a half to the production of so noble a specimen of iron shipbuilding," H.M.S. *Warrior*.[77] At first, Robinson took a lenient approach. Even though the company could be legally asked to reimburse the government £8,000 for its own work in completing the first ironclad, the costs per ton for the *Resistance* and *Defence* were even more. He advised the Admiralty that "the liberal conduct they will have adopted with regard to this Company, will I think prove in the end of great advantage, as it will encourage private Firms to tax their resources to the utmost to answer any extraordinary demands which the Government may find if necessary to make upon them." Thames' letter to the Secretary of the Admiralty,

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[75] *Ibid.* Enclosed bid for tenders dated 5-8-1861.
[76] ADM 1/5774, 5-9-1861.
[77] ADM 1/5774, 11-11-1861.

William Romaine, bears consideration for its description of the real problems facing Britain's shipbuilding industry. The question was not just changes in design, multiple orders and rapid production rates; the firm required all extra costs plus "the moderate addition of twelve and a half per cent profit".[78]

Meanwhile, the *Resistance* herself, launched in April, meanwhile, was still on the Victoria Docks waiting for Admiralty possession. Due to the state of the tides, she would not be available now until 3 December. She was far from complete and ready for service. Her propeller "still in a barge on the docks"; "There are no Anchors or Cables on board", and "the Steering Gear is not completed, but temporary Steering Gear might be fitted by Wednesday next…There are no coals at present on board the Ship."[79] Though £50,000 was set aside in the estimates for any extras with the first four ironclads, Robinson was careful to mention that "their Lordships would be perfectly justified in authorizing [sic] the payment of £5,000…on account of extras on the *Resistance*, though not on account of the terms of the contract…"

During the war scare with the United States over the *Trent* Affair, from the end of November until the new year, the Controller's attitude towards private contractors soured a great deal. The same company which launched the *Resistance* nearly a year before, Westwood, Baillie, Campbell & Co., was also responsible for the new ironclad *Valiant* and informed the Admiralty "we have a claim of £12,000 for Extras, etc., which we are satisfied could not be reduced to £8,000 if disputed…"[80] Robinson objected to these claims three weeks earlier, observing that "in dealing with the *Warrior*'s case their Lordships were induced to consider it as favourably as possible for the Firm employed in

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[78] *Ibid.* Enclosed letter dated 5-11-1861.
[79] ADM 1/5744, 18-11-1861.
[80] ADM 1/5802, 28-3-1862; enclosed letter from James Campbell of Westwood Baillie to Paget, Admiralty Secretary, dated 26-3-1862.

building that Ship, for reasons which were obvious, and which must be so fresh in Their memories that they need not be repeated."[81] Though the *Resistance* was as new a ship in design and structure to its builders as the *Warrior* was to Thames Iron Shipbuilding, "the Firm had ample means of judging of the nature of the work required of them, and of their resources for executing it." By taking on the *Valiant* at £42 per ton after twelve months of construction on the former ironclad, at £44 per ton, the contractors signalled their confidence in enjoying a profit from extra work, and Robinson coolly remarked "it certainly is not the province of the Admiralty to take care that no loss should fall on the Parties who, as Men of Business, had every means of knowing how best to conduct their own affairs." Now the *Resistance* was delivered far later than hoped, the *Valiant*'s progress was in jeopardy and the final bill calculated by the Controller's Department was £157,972.11.02—a figure which put the Admiralty "ten thousand pounds beyond what they were strictly entitled to by the terms of the Contract." Robinson accused them of more than carelessness in accepting the burden; in his opinion the builders were simply 'wasteful' and 'negligent' with the job itself. The issue of added cost was, if anything, a justifiable complaint *by the Admiralty*, whose own proposal, Robinson noted, "appears to me to be as liberal...as possible, unless manifest injustice were done to other Contractors."[82]

Problems continued to emerge from every corner, however, which must have eroded Robinson's original optimism even when private contractors did feel obliged to '"tax their resources to the utmost". On the 5 May 1862 Robert Napier & Sons wrote to Romaine "the precedence of the *Warrior* was of no practical assistance to us, but was in many respects, and more particularly in the details of finishing the *Black Prince* after her launch, seriously detrimental from having to receive very often our instructions at second

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[81] ADM 1/5802, 6-3-1862.
[82] *Ibid.*

hand from the *Warrior*'s Inspector." This was despite the fact that work was performed day and night, "employing on the *Black Prince* in the Building Yard alone fully 1600 men..."[83] In addition to overruns of £8,463, Napier claimed an absence of actual profit in building *Warrior*'s sister-ship, echoing directly the appeal made by Thames Iron the previous November. But Robinson disputed the figures as erroneous and the evident client jealousy as suspicious. In fact, "neither of the contractors received the whole command named for their respective Ships, each of them failed to deliver the Ship complete, and from the sum of £255,164 which the *Warrior* cost, £3,578 was deducted on account of works done in the Dock Yard; and from the sum of £251,071 which the *Black Prince* cost, £10,818 was deducted for work done in the Dock Yard to complete the Ship."[84]

Nor was the problem restricted to the dockyards. The relatively sudden large scale manufacture of iron armour plates appears to have caught everyone unprepared. Between the delays occasioned by the ships themselves and the Admiralty's hesitancy in committing fully to designs from inception to actual achievement, the qualities of the all-important armour protection were sources of impediment. Hence, on the same day Napier was writing to Romaine, Robinson was obliged to report to the Board that "the supply of Armour Plates is in an unsatisfactory state":

> Nine Firms at the beginning of this year were after survey of their Premises considered to be capable of supplying Armour Plates of [solid] 4½" thickness...
> Tenders have been accepted for the supply of Armour Plates, dependent on their due resistance to the effects of shot, from five Manufacturers for 6 Ships:
>
> | | |
> |---|---|
> | *Achilles* | W. Sanderson |
> | *Royal Oak* | The Thames Company |
> | *Royal Alfred* | Mess. Brown & Co. |

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[83] ADM 1/5802, 8-5-1862, enclosed letter dated 5-5-1862.
[84] *Ibid.* Robinson's reply to the Admiralty is dated 8-5-1862.

Ocean	The Butterley Company
Prince Consort	W. Sanderson
Caledonia	Lancefield Forge Company

Of the nine manufacturers above named four only up to this time have succeeded in making Plates which successfully resist the trials:

The Thames Company
Mess. Brown & Co.
W. Sanderson
Mess. Hill & Smith
[not accepted for contract]

The other firms though some of them are undoubtedly capable of manufacturing these Plates have failed to do so hitherto, the quality of the Plates having proved inferior, and unsuitable for the purpose.
In November last a Tender was accepted for Armour Plating for the *Caledonia* from the Lancefield Forge Co. The Plates to be delivered in six months from the date of the order.
No Plate that this firm has manufactured has stood the test, and five months have elapsed.
In the month of January last a Tender was accepted from the Butterley Co. for Armour Plating for the *Ocean.* The Plates to be delivered in six months. No plate has yet been completed and consequently none have been tested.[85]

Robinson then recommended that the 5½-inch plate contract for *Royal Sovereign* be given to Brown & Co. As he confidently expressed, "I may add that there is no doubt of Mess. Brown's capability to fulfil any Contract they may enter into, or of the excellency of the work they turn out; and that the prices named in their letter are reasonable." This too would prove to be a completely ingenuous prediction.

On 12 March 1862 Robinson reminded the Admiralty "the *Warrior* having 4½-inches of iron Plating over 18-inches of Teak and the *Minotaur* and her class having 5½-inches of Iron Plating over 9-inches of Teak," the new armour scheme for the *Minotaur*-class broadside ironclads was still uncertain until the Iron Plate Committee, which seemed "to be rather doubtful whether 5½-inch iron plates of good quality can be manufactured,

[85] ADM 1/5802, 5-5-1862.

though the Contractors for building these ships do not doubt that they can easily be procured," actually conducted its tests.[86] By 15 May nothing was accomplished and again the Controller submitted an urgent request for a target to be fired upon at the testing grounds at Shoeburyness.[87] The results when they came were more than disappointing. Firing at the target with the new 12-ton gun (with cast-iron spherical, 150-lb. shot, and a 50-lb. charge) at a combat range of 200 yards, "the *general damage* was much greater than in the *Warrior* Target, although the latter was subjected to much more severe fire."[88] After only four heavy shots the target itself was battered beyond service. The first shot alone had "hit the centre plate...and made a hole through the plate 12.5" x 12.2", and about 13" deep," while the second hit had struck the bottom plate and gone clean through, making a hole "13" x 12.5"..." The test had proven the inadequacy of the new scheme, the crucial differences in iron plate manufacture (as some plates from submitted by different firms reacted better or worse than others), the inadequacy of the fastenings of the through bolts of even the first generation ironclads (less than 2 inches in diameter)—and the power of the heavier gun, as the much vaunted, traditional 68-pounder smoothbore fired immediately afterwards at the same range created serious dents but no penetration. The Committee's findings were that:

> The advantage of the *Warrior* wood-backing is fourfold.
>
> 1. It *stops* small fragments of iron from entering the ship.
> 2. If large pieces of the plate are broken off, it *holds them in their places*, and makes them still useful, to a certain extent.
> 3. It *deadens the jar*, and so preserves the fastenings and the structure generally.
> 4. It *distributes* the effect of the blow over a *larger area* of the skin and frame of the ship.
>
> We do not attach importance to wood as a *support* to the plate. In this respect we conceive it is inferior to more rigid material.[89]

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[86] ADM 1/5802, 12-3-1862.
[87] ADM 1/5802, 15-5-1862.
[88] ADM 1/5809, 22-7-1862.
[89] *Ibid.*

With regard to the specific deficiencies of the iron-forging of certain private firms, even for those ironclads of the same class, the Iron Plate Committee remarked in September 1862 that in testing the new "120-pounder Whitworth gun…fired from a 600 yards range, at a target representing the side of the *Warrior*," the plates were of a "very inferior character of the 4½-inch plates of which this *Warrior* target was composed. They were from Parkhead forge, near Glasgow, and are said to be of the number of those made for the *Black Prince*."[90]

By now the situation seemed to be getting worse rather than better, with British iron shipbuilding in the hands of private industry. The Controller noted five firms in particular, Napier, Thames, Laird, Samuda, and Mare, which were unacceptably delinquent with their orders:

Ship	Contractor	Contract Price
Minotaur	Thames Iron Ship Building Co.	£321,117
Northumberland	C. J. Mare & Co.	£295,295
Agincourt	J. Laird, Sons & Co.	£329,393
Hector	Napier & Sons	£172,677
Valiant	Westwood, Baillie, Campbell & Co.	£207,212
Orestes (troopship)	J. Laird, Sons & Co.	£73,109
Tamar (troopship)	J. Samuda & Co.	£68,188

The situation with the *Northumberland* was worst. "The Contractors have been repeatedly written to and urged to expedite this Ship, but without effect. She should be launched in February 1863, but there is no prospect now of her being launched earlier

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[90] ADM 1/5809, 10-10-1862, enclosed reports, dated 16- and 25-9-1862.

than April 1864." The counsel of the Admiralty Solicitor, moreover, could not easily see the contract withdrawn and handed to another builder for no other reason than 'slow progress', as this was not a specific clause in the contract.[91] A letter to Thames Iron regarding the "backward state" of the *Minotaur* met with a list of numbered complaints which included the alterations to the ship's design and construction ordered subsequently by the Admiralty. These involved the changing of a raised screw while under sail, as with the first generation ships, to a fixed one requiring the re-working of the complicated stern posts, and changes in the armour itself in proportion to its wood backing. Robinson addressed these points one at a time, "in order to prevent the Board of Admiralty from being placed at a disadvantage at any future time, if the Company should become remiss and fail to complete the Contract within the stipulated time."[92]

Even so, he must have felt that Thames Iron was not alone as, "the case of the *Valiant* has been already reported on, and the progress of that Ship has been far less satisfactory that that of the *Minotaur*."[93] Part of the problem was organisational, for even within the Admiralty misunderstanding, indecision and delay were likely if changes were not constantly made to meet the new demands. A revealing report on bureaucratic stiffness was made on 19 November 1862, entitled "Ships in Commission—Alterations & Additions, Mode of Processing". This described "the present roundabout practice...as follows:

> The Captain writes a letter containing the suggestion to his Commander-in-Chief who forwards it to the Secretary of the Admiralty, who sends it to the Lord in whose department the matter is supposed to be, who orders the Controller to report, who sends it back to the Dock Yard Officers for the necessary

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[91] ADM 1/5802, 26-9-1862; also ADM 1/5802, 2-7-1862, where the Solicitor's enclosed letter dated 3-7-1862 identifies the loophole in the contract: "the Admiralty have no power reserved to them by such Contract to enter and finish the Vessel until the period limited by the Contract for completing it has expired. There is no penalty for the non-progress of the Work."

[92] ADM 1/5802, 26-11-1862.

[93] *Ibid.*

> explanations and reports, who send it back to the Controller, who sends the report with any observations he may think requisite to the Secretary of the Admiralty, who places it in the hands of the Lord to whose department it relates, who gives the requisite authority, which is communicated to the Controller.[94]

In December 1862 Rear-Admiral Robinson mounted a summary analysis of the needs of the Royal Navy.[95] The issue at stake, though superficially one of government decreases in dockyard wages, was nothing less than the ability of private industry to adequately provide for the needs of the nation. "The number of Men, Seamen, and Marines voted for the service of the Navy," the Controller began, "tells directly on the number of men required in the Dock Yards." As it was, for every man afloat there could be expected a rise in dockyard wages of £10 over the next three years and the proportion was a reliable indicator as the number of Men, Seamen and Marines voted for each year rose or declined. This represented a ratio of 40 per cent devoted to new ships, wood and iron, and the burden upon the Navy was only increasing as the number and tonnage of steam ships grew each year—which meant rising costs for maintenance and fitting as a whole. Furthermore, "it may...be taken as a rule that one fourth of the whole Force afloat requires to be renewed every year, that is, that if 300 Ships are in Commission in any given year, 75 will be paid off and require repair and refit." The number of ships in commission by the end of 1862 was such that nearly all of those ships paid off and requiring repair and refit, "must be carried over to the ensuing year," whereas in the previous year already half of those paid off were necessarily carried over.[96] However, the number of new ships under construction was *decreasing*, which possibly meant breaking even in the estimates. In fact, Robinson calculated, "it is just

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[94] ADM 1/5802, 19-11-1862.
[95] ADM 1/5802, 3-12-1862.
[96] Even Sir Frederick Grey of the Admiralty was obliged to respond to Vice-Admiral Milne's request for the replacement of ships on his precarious American Station that "we cannot divert our dockyard men from more important work to do what is after all not an absolute necessity," 4-10-1862, MP.

Year	Number of Ships	Tons
1859	15	37,364
1860	23	40,519
1861	15	21,482
1862	9	16,616

possible to keep pace with the wants of the service with slight reductions in the Force of the Dock Yards... As far as can be foreseen there will be a saving on Vote 8 of between thirty and forty thousand pounds."[97]

But the issue before Parliament of a "total abandonment of Ships building in our Dock Yards would be a dangerous measure to adopt in the present transition state of our Military Navy," and here the Controller ran through the main considerations, requirements, and objectives for Britain's ironclad program as he saw them. First, the issue between wood and iron ships was suggested as one between the "present large force afloat", and its maintenance, and the ability of Royal Navy yards to adopt to the utter necessity in naval warfare for armour cladding ships.

Robinson's unequivocal belief that "the ordinary wooden Ship is sure to be immediately destroyed by the ordinary artillery of all nations, and the larger the Ship the more certain the destruction," probably refers to the only such engagement known by 1863; the destruction of the frigates *Cumberland* and *Congress* by the ironclad-ram *Virginia.* Not just France, but "every maritime power, according to its means, has considered it indispensable to clothe its Military navy in Iron Armour," yet because the greatest of these (and the nearest to England) had "perfected and prepared a large number of [sea-going] Ships," Robinson recapitulated the basic decision of the Admiralty that such ironclads "can only be met on equal terms by a similar description of Force....a certain number of Ships which can contend on equal terms with our neighbours." Hence the

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[97] ADM 1/5802, 3-12-1862.

determination to employ numerous commercial iron shipbuilders—a recourse of little alternative when the Royal Navy itself was obliged to maintain in its own facilities such a 'large force afloat' for the protection of British interests worldwide.

Nevertheless this solution had only led to problems; "the work is slow, very expensive, requires an immense amount of inspection as to Workmanship and materials and in no case has such a ship been perfected without large expenditure of time and money in the Dock Yards." Even if iron shipbuilding was found to be unquestionably better than wooden conversions, Robinson was severe in his judgment that "our past experience teaches us that no reliance whatever can be placed on private Shipbuilders keeping any engagements they may enter into with the Admiralty."

Since the Controller maintained "that our present large force afloat, and the reliefs that it requires, are insuperable objections to any considerable reductions in the expenditure of Wages in our Dock Yards," the natural conclusion would be to favour wooden conversions into ironclads in the government facilities. It was the second plan adopted by the Admiralty in May 1861, along with the privately built iron-hulled ironclads, and it was bound to mitigate any "new discovery of the power of Artillery," which "disturbs all foregone conclusions," (and therefore suggested time-consuming iron-hulled ventures were short-lived in any case.) This would both modernise the navy and free it from any commercial exploitation or failures. It would also give the Controller, the Navy, and the Government much more direct and encompassing control over the means of ironclad construction. After all, Robinson made sure to point out to the Admiralty, "whatever may be said as to Iron Ships Armour Plated it is to be remembered that we have not yet

afloat one Ship of that description plated from end to end, while several powers have actually sent to Sea wooden Ships so protected."[98]

This marked a personal preference by the Controller for more fully-protected ironclads, more quickly produced, at less cost, and perhaps handier as well, if limited to some degree in range—although range was defined inevitably as the ability to be at least as good as the French examples.[99] It was a discussion of these very principles which suited the Royal Navy best in the mind of its Controller that contributed to the debates with Captain Coles. Likewise, it was the preference of Rear-Admiral Robinson for ships of the *Royal Oak*-class that sealed up the possibility for any large introduction of turret ships based on Coles' designs; for by the time the Admiralty was willing to seriously reconsider the inventor's claims—in the wake of the public furor which accompanied the news of the American ironclads—the nation's dockyards were already filled with wooden conversions and standard repair and fitting of wooden steam vessels on the one hand, and massive iron-hulled constructions on the other, which were consuming the full attention of those contractors they did not break altogether.

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[98] *Ibid.*

[99] In mentioning the capabilities of the "*Prince Consort*-class [*Royal Oak*-class]" at sea Robinson stated "after seeing the French and Italian Iron-clads, which perform all the service required of them in the Mediterranean, and elsewhere, I have no hesitation in saying that these ships are fully equal to them, and need not shrink from any comparison with any wooden Iron-clads afloat," ADM 1/5892, 19-11-1864.

III. Enter Captain Coles

The two trends in the British ironclad program, the move by Coles for turret ships as opposed to broadside-ironclads, and the desire of Robinson to shed the wooden bulk of the navy in favour of sea-going ironclads themselves more heavily armoured (and then armed), began their convergence back at the beginning of 1861.[100] If the initial decisions of the Board of Admiralty were designed to answer the French challenge, ship to ship, then the list of Louis Napoleon Bonaparte's new ironclad navy included a preponderance of floating batteries for coastal and harbour defence.[101] The program which included the *Valiant* and *Hector*; the five *Royal-Oak* wooden conversions; the improved *Warrior*-ship *Achilles*; and then the even larger *Minotaur*-class iron broadside ships left no room for coast defence, as discussed above. As with the *Warrior*, the first instinct in filling in this strategic layer was to design a ship intrinsically superior to its French counterpart in every way. This included its powers to carry the war to the other side of the English Channel in an assault on heavily fortified naval bases such as Cherbourg. The original armoured floating batteries, if not the concept of "block ships", were constructed for this purpose to begin with during the Crimean War.[102] Their success at the bombardment of the forts at Kinburn protecting Sevastopol in September 1855 had proven the opportunities for penetrating closer to shore under heavy fire to deliver at close range the firepower more vulnerable, deeper draught wooden screw-liners dared not to. In that sense—and this is significant—the first coastal ironclads acted as almost classical siege engines. It was this stigma of steam "batteries" which clung to the perception of these types of ironclads in mid-nineteenth century naval warfare, and contributed to the

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[100] ADM 1/5765, 23-5-1861 "Iron Cased Ships".
[101] Baxter, *Introduction*, 102-3, 112, 113-114.
[102] Hamilton, *Anglo-French*, 74-8: "the Crimean War at sea, primarily a coastal war, was distinctly peculiar in comparison with the kind of wars the British and French navies were accustomed to, where for the most part the great events had been engagements on the high seas. This peculiar war, and the new naval instruments it gave rise to, for some years closely shaped men's conceptions of future naval wars, even where the supposed opponents were Britain and France themselves," 78.

prejudice of them against more traditional types of man-of-war, namely, the graceful sailing broadside vessels. Coastal ironclads were "infernal machines"; sea-going ones were "armoured ships".

Present at the Kinburn bombardments was Commander Cowper Coles, who three months before had devised a raft to carry a 32-pounder and its crew into shallow water and attack the guns at Taganrog in the Sea of Azov. The plan worked, but the inherent deficiencies of the French broadside-batteries at Kinburn, namely the large and vulnerable gun ports needed to permit the training of the guns on either axis, compelled him to seek an improvement. With the endorsement of his uncle, the Black Sea theatre second-in-command Admiral Sir Edmund Lyons, Coles' idea for a steam-powered raft of extremely light draught (5-feet on average) mounting a single 68-pounder cannon in a hemispherical—though non-revolving turret—was sent to the Admiralty for consideration in November 1855.[103] It was this occasion which the inventor would refer to on first receiving news of the U.S.S. *Monitor*, six and half years later. But one crucial difference was that the ship itself was expected to manoeuvre to bring its single gun to bear. Furthermore, because of its qualities as a close-shore vessel, both the Surveyor, Admiral Walker, and his Chief Constructor, Sir Isaac Watts, rejected the craft on 22 January 1856 *for its obvious poor seaworthiness*, and for the lack of full armour protection in Coles' design.[104]

After several years Coles returned with a new submission, evidently taking into account many of the previous objections. He had now reversed his opinion that turning the ship itself was acceptable, when the armour-protected guns themselves could be mounted on a

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[103] For one of the best accounts of Coles in this period see David B. McGee, "Floating Bodies, Naval Science: Science, Design and the *Captain* Controversy, 1860-1870", University of Toronto, unpublished Ph.D. thesis, 1994.
[104] Baxter, *Introduction*, 181- 195.

revolving turntable. With the Admiralty's order to build the *Warrior*, on 11 May 1859, in response to the French *Gloire*, Coles applied to mount several such "shotproof hemispherical screens" on similar vessels.[105] The improvement over a partially-protected fixed battery to him was obvious. But Walker first made the important observation—which was to harry Coles to the very end of his life—that:

> ...as these guns with their screens are to be ranged at the mid-ship fore and aft line of the deck they could only occupy the intervals of space between the masts and funnel and other necessary middle line fittings of the vessel, while the spread of the shrouds for the support of the masts would very considerably restrict the degree of training of several of the guns, either therefore the guns must be small or the ship must have great length...[106]

It was a fundamental incompatibility between turrets and sea-going ironclads reliant upon sails as their secondary, even primary, means of propulsion. It is remarkable that Coles seems to have forgotten the tactical origins of armoured ships to begin with and focused his attention instead to their armament. Revolving turrets on light-draught ironclads had other merits than engaging fortifications on land, and the inventor was fairly obsessed with the conviction that revolving turrets held many advantages over the traditional, somewhat unimaginative broadside. But what he failed to grasp were the practical limitations to turret ships on the high seas—which at the same time were their greatest strength. If only broadside ships could be successfully relied upon to employ full sail for long-distance cruising or fleet actions on the open ocean somewhere, and turrets were superior to broadsides, then the strategic limitations to turret ships also involved the strategic limitation of broadside ironclads themselves. If the latter were to engage fortifications from any distance they would be prey to the former, whose zone of operation ships like the *Warrior* had overlapped. If the latter were denied the power to attack fortifications—or to conduct close blockades over ports defended by the latter, of

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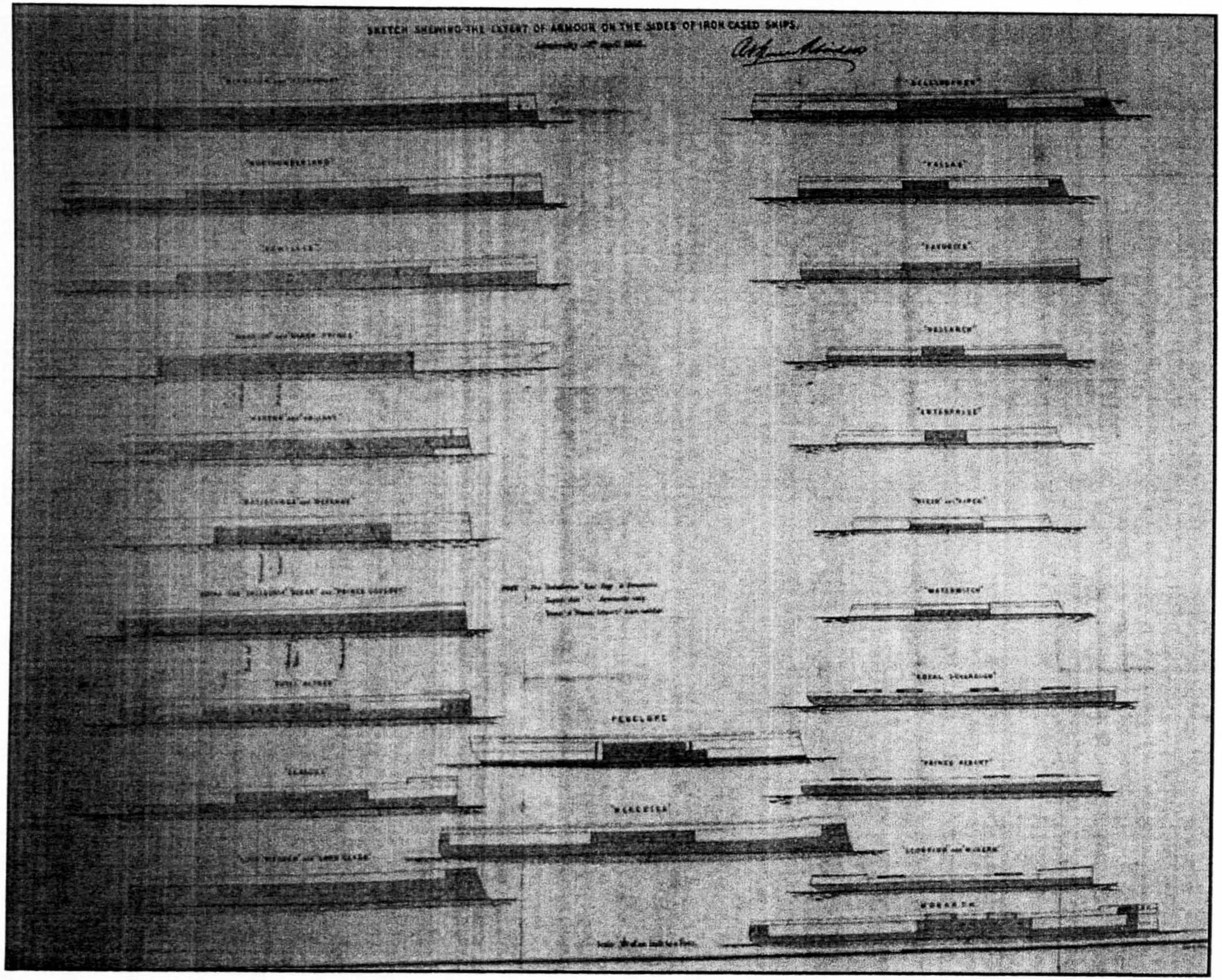
[105] *Ibid.*, 187.
[106] *Ibid.*, 188.



"Extent of Armour on the Sides of Iron Cased Ships", 30-4-1866

Contrast the partial armour protection scheme of *Warrior* and *Defence* to that of *Valiant*, then *Achilles* and the *Minotaur* class. Only the *Caledonia* and other *Royal Oak* class conversions featured full protection for their size. After that the tendency was clearly towards more concentrated, thicker armour schemes protecting fewer though heavier guns until the "central battery" profiles themselves resembled American monitors and rams, though with extensive surrounding superstructures. (MP)

what use were they? They were superior to any wooden vessels on the high seas by being impervious to at least explosive shell-fire. This made them extremely potent as commerce raiders or protectors. Moreover, a squadron of such ships would be superior to a single ironclad of comparable strength. It was therefore the original threat from France, that greatest of continental powers who had often employed a *guerre de course* naval strategy against (Britain's) commerce, which drew attention away from the unique primacy of coastal defence implicit in Coles' turrets, while at the same time convincing the Admiralty that an ocean-going ironclad fleet was the *only way to check French aggression in a naval war with her.* It was an expensive hypothesis which even Coles bought into.

The Admiralty, however, could recognise the potential value in turrets themselves, particularly for coast defence purposes. Shortly after Coles' submission in 1859 work began on commission to the private shipbuilder J. Scott Russell for the construction of an experimental turret on Coles' plans. This was ironic given Russell's claim to fame for the *Warrior.* In the meantime Coles prepared new specifications for a turret ship, which he finally patented on 15 June 1860. These included several revolving turrets mounted along the middle-line, and undoubtedly pointed the way towards the steel battleships of the future. The ship-platform itself was fully armour-protected, the sides inclining at 40 degrees from the water's edge to a point above the inclined truncated cone of the turrets themselves, which were thus partially sunk below the edge of the "upper deck". In essence, the ironclad, had it been constructed, may very well have resembled one of the later Confederate casemate-ironclads but with the superior feature of a turret armament. Only in the U.S.S. *Dunderberg* was this general scheme put into action, but before the massive casemate (which was also fitted for broadside ports) was completed the turrets above were left out. Coles also introduced the measure of "a flying bulwark…capable of being turned down either inwards or outwards in order to allow the gun to be fired over

all from beneath the shield," which would be a significant feature with future low freeboard turret ships rigged for sail, as "this flying bulwark would mask the battery until fire is opened, and shelter the crew in bad weather from wind and sea..."[107] His plan, however, does not specify whether the ship was intended for coastal or open ocean operations. Judging from the design it would seem more suitable for the former purpose. There are no details of sail configurations; the patent is for the turret and the armoured shell. Yet, as Baxter points out, Coles alluded to fifteen such vessels, each armed with 9 turrets carrying 18 guns, at the Royal United Services Institution on 29 June 1860:

> An enormously strong ship is thus obtained—not weakened, as are ordinary ships, by numerous portholes, but having a continuous side, with the weights placed amidships instead of at the sides....three of these shield ships would be equal to ten 3-deckers.... In future our fleets must fight in armour; and supremacy afloat must depend henceforth on superior ability to produce the new ships required.[108]

Here the reference to ironclad construction is telling for the efficiency of the ships in armour and size would make them generally less expensive than the controversial *Warrior.* Also significant is a reference not to tackling fortifications, or, at this point, not even enemy ironclads, but to wooden ships-of-the-line. To replace broadside ironclads or "3-deckers" with turret ships was never intended by Coles to forfeit command of the sea.

Nevertheless, the sea-going oversights in the design did not escape the Admiralty constructors any more than before, even while the publicity of the concept began to expand. It was in fact a peculiar feature of the public debate which eventually surrounded Captain Coles and his turret-ship inventions that the issue was looked at from completely different ends. To the public at large, the superiorities of a turret ship over a fixed row of

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[107] ADM 1/5802, 6-5-1862; enclosed *Specification of Cowper Phipps Coles--Iron-Cased Ships of War* (London: George E. Eyre and William Spottiswoode, Great Seal Patent Office, 1860); also Baxter, *Introduction*, 189.
[108] *Ibid.*, 189.

guns were easy to understand. So was the concept of an ironclad itself; even though in all previous experience, the emphasis was just as much upon superior numbers of ships-of-the-line or seamanship than the particular form of the armament, or the physical protection of the vessel itself. The situation had now changed. In the Age of Sail (and then also steam), the best means of defence was in superior firepower alone. Wooden walls could deflect some shot, but that was not necessarily their purpose, and the key to preventing damage to one's own vessel was simply to inflict more on the opponent's first, and most—usually by manoeuvre (raking), range, or heavier weight of broadside at the closest effective range, and as fast as possible. Coles' inventions challenged this in several fundamental respects. The key to a superior offence was now in the superior *defensive* qualities of the armoured cupola. Coles does not mention weight of broadside or firepower because, as Spencer Robinson was to reassert, "two guns in a ship that cannot be sunk and where the battery is protected will prove more than a match for twenty, in an ordinary wooden Ship."[109] In an armoured ship range counted for little except for the actual likelihood of hitting the target, as with broadside fire, while the need for finding the proper tack or lee in combat was mitigated—even without the use of steam-driven screws—by the manoeuvring of the armament itself; by forward or aft fire regardless of the position of the ship and in the tracking of an enemy. It was a better form of man-of-war altogether, and to a growing audience outside the Admiralty it was difficult to see why the professionals were hesitant to accept the obvious.

On the opposite end of this debate, however, were the practical limitations in applying the principles of an armoured cupola to every purpose a man-of-war in the Royal Navy may have. In early 1861 the new Controller, Spencer Robinson, reported the opinions of the "professional officers of his department", Isaac Watts, and his assistants Joseph Large and Richard Abethall, that even "vessels of the size of the Gun Boats are much too small to

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[109] ADM 1/5802, 1-4-1862.

carry Captain Coles' revolving platform and iron shield or any adaptation of it (as recommended by Captain [Sherard] Osborne) without losing the advantage of light draught of water, and a great deal of stability." Furthermore, "the propositions to armour plate the sides for the protection of the boilers; to place the Boilers within a dome of wrought iron, or to make the outer side of the wing boilers of increased thickness to resist shot; to employ wrought iron plates instead of wood more generally in the construction of Gun Boats; and to fit transverse watertight compartments in them, appear to us impossible to be carried out in such small vessels." Osbourne's original submission, dated 17 November 1860, also made the often overlooked observation that "...from the day rifled cannon came into use, ship armour and the introduction of vessels offering less larger area than our present line of battle ships, has become an absolute necessity for success in naval warfare."[110]

Nor was there any indication that a broadside-ironclad would be inferior to a turret-ironclad. While the turret ship could aim its armament more freely, the broadside ship had twice the guns and could engage simultaneous enemies in a sea battle. A similar exposition of the broadside argument began when Henry Hubbard, a Gunner on H.M.S. *Gannet* at Constantinople, wrote to his commander on 15 March 1861 of changes in armament "that will change this Ship into a good Fighting Sloop, capable of not only holding our own against, but proving very destructive to, an enemy of even superior numbers." Hubbard argued for a smaller number of guns (though the new rifled, heavier ordnance of Sir William Armstrong) positioned on pivots which could deliver more overwhelming fire at a much longer range over a greater arc. The smaller number of guns would also entail a relatively smaller vessel, which was an advantage in combat. Captain Richard S. Hewlett, of the gunnery training ship H.M.S. *Excellent* at Portsmouth,

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[110] ADM 1/5774, 25-2-1861; enclosed letter from Captain Sherard Osbourne to the Secretary of the Admiralty, dated 17-11-1860.

disagreed. The problem to him was the slower speed of the *Gannet*, which would not allow her to choose the range. "Now it is in close Action that every Engagement will be brought to an issue, and although a Vessel with powerful long range Guns may no doubt annoy another from a distance of 1500 or 2000 yards, experience has shown us that a very large quantity of Ammunition may, under these circumstances, be fired away at a small object (constantly on the move) with little or no effect."[111]

This time the Board sided with the lower rank. On 18 July Robinson acknowledged "the established armament of the present sloops of 17 and 11 guns being in many respects, and especially with reference to the more powerful nature of modern artillery, very inefficient," that reducing the number of 17-gunned sloops to 6 guns with mobile guns would be superior. "The weight of shot thrown at a broadside by the proposed Armament will exceed that now delivered; the range will be far greater, and the angle of training of the guns on the broadside will be 100° as compared with 69° on the old plan."[112] On 2 September Grey confirmed the change in armament for the new steam sloops under construction.[113]

Though the double armament added to the weight, length, draught, and cost of the broadside-ironclad, the actual weight, proportion and cost of any turret ships were yet to be discussed; and as long as the *Warrior* carried the heaviest guns available, in a larger quantity than the *Gloire*, behind armour thick enough to withstand most fire, she was herself "Mistress of the Seas". But still the ideas of Captain Coles, even before the news

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[111]ADM 1/5774, 18-7-1861; enclosed letter dated 15-3-1861, Gunner Henry Hubbard to Commander Lambert.

[112] *Ibid.* It is interesting to note the phrasing "weight of shot thrown at a broadside". This may have been referring to the growing likelihood that foreign station vessels might encounter armoured ships, where "the continuous fire from a greater number of smaller Guns... spread more over the Vessel" would be futile.

[113] ADM 1/5774, 2-9-1861. In the summer of 1864, *Gannet* returned home for repairs and refit at Devonport; the Controller then ordered that "she should be armed during her next commission with a heavy gun in midships, and a lighter rifled pivot gun at bow and stern, in place of the eleven 32-pounders with which she was armed during her last commission, and of which ten were 25 cwt. guns only," ADM 1/5891, 24-8-1864.

of the *Monitor* and the *Virginia* escalated the public debate into a national one (in March 1862), whispered the latent contemporary appeal of "Progress" that experiments, if they were made, seemed bound to justify.

Such an opportunity did not come until mid-September 1861, by which time, in addition to the first four broadside-ironclads—two large and two small—the British Admiralty had committed itself (in responding to the naval intelligence reports from Paris) to eleven modified ironclads of the more customary design. Coles' prototype turret, whose armour arrangement matched the *Warrior*'s, was transferred to the Crimean War ironclad-battery H.M.S. *Trusty* for testing under severe fire. The trial was a complete success; the turret taking 33 hits from 68-pounder smoothbores and 110-pounder Armstrong rifled guns and yet proving capable of firing at moving targets without complication while the vessel itself turned. The loading of the guns themselves was also proven more efficient than the cramped broadside quarters. Interest in the highly publicised experiment went straight to the top. The Prime Minister (Palmerston) wrote with evident approval to his Foreign Secretary, Lord John Russell (1st Earl), on 24 September 1861 that "Somerset thinks that comparatively small iron cased ships armed in this way with all their guns, perhaps 16 on deck, and without any portholes and therefore low in the water, will prove formidable ships of war."[114]

The following day the Admiralty directed Robinson to report on Coles' proposals for a new ironclad warship. Despite noting that "the protection afforded by the Cupola to the guns' crews is complete, and far more effective against vertical as well as horizontal fire than that obtained by iron plating applied to the general form of ships sides; and the offensive power of guns in these shields is also considerably greater than that possessed by guns mounted in the ordinary way and fired through Port holes," the Controller seems

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[114] Baxter, *Introduction*, 191-2.

to have come away from the interview with the captain-inventor somewhat confused.[115] First of all, it is likely that the design for "a Flush-deck vessel to carry two cupolas with four Armstrong guns" was in fact a modification of Coles' original June 1860 patent turret-vessel. Robinson's note of better protection from "vertical as well as horizontal fire" must refer to the angled turret ("shield") design; sloped at right-angle fire from another ship, and at right-angle fire plunging from directly above. He also remarks that "up to this time [Coles] has not clearly determined whether an inclined or vertical side is to be part of his plan." He is probably not referring again to the form of the turrets themselves but the angled casemate of the ship itself. This is corroborated in the enclosed "Remarks on the proposed Designs for a vessel to carry two of Capt. Coles' shields," from the Chief Constructor, dated the day *before* the Controller's report. Here the Constructor notes two plans, where "the iron on the inclined side is…too thin to offer effectual resistance to shot, being only equivalent to 4½-inches vertical plates <u>without backing</u>."[116] As specified in Coles' 1860 patent, "the outer side is to be of iron and should be constructed as lightly as is consistent with the required strength."[117] Though the plans seemed sensible on paper, the Controller continued:

> But I cannot understand from anything that has been described to me by Captain Coles that the ship which is to carry these Cupolas stands less in need of Armour Plating than any other ship so that if their Lordships have decided, and decided wisely in my opinion, that every part of a ship must be protected in that manner, it will be necessary that Captain Cole's ship should be plated all round as heavily as any other ship, and carry in addition the weight of the cupolas. To do this, and to obtain a tolerable degree of speed, larger dimensions per gun will be required than have yet been given in any ship, and consequently the expense per gun will be infinitely greater.[118]

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[115] ADM 1/5774, 23-10-1861.
[116] *Ibid.* Previous British tests on armour plates indicated both that inclined armour afforded little more protection for the added weight involved with the increased area required by the angle, and that wood support to vertical iron plates helped absorb the shock of impacting shot.
[117] ADM 1/5802, 6-5-1862.
[118] ADM 1/5774, 23-10-1861.

If the ship in question was similar to Coles' 1860 patent, according to the opinion of the Constructor, and also Robinson, the whole concept of the angled sides was inadequate and required thicker support. As with the 1860 design the armoured vertical side which began at the waterline from the casemate had "the important defect that in consequence of not having sufficient displacement to allow of the Armour on the transverse bulkheads being carried more than 2ft 6ins below the waterline, the Engines, Boilers, and Magazines are greatly exposed to a raking fire." According to the Constructor, if "sufficient security" was the issue, "a much larger ship would be required." Whether or not there was an element of professional bias involved—for Coles' ship was in every way a public challenge to his own—this must have caused the Controller doubt, which was only increased when he promised the Board of Admiralty improved designs correcting the various flaws "as soon as I can get exactly from Captain Coles what is considered requisite for the proper adaptation of his shield to a sea-going ship."

Although events were finally underway which would lead to the order for both the *Prince Albert* and the *Royal Sovereign*—Britain's first turret ironclads—Coles himself must have come away from the October meeting somewhat disappointed. His inclined armour plan was clearly disapproved of and his lack of specific technical familiarity was exposed on several points. The most discomfiting of these, again, was the issue of sea-keeping. Robinson would most likely have preferred to abandon the inclined casemate. But as the vessel would still require extra armour protection below the waterline, and the ship would need to be enlarged to carry the added weight, and the more powerful engines and longer, finer-lined hull to adjust for the increase in weight and loss in speed, why not add more turrets? Robinson addressed the main issue directly when he remarked "that probably the

most disadvantageous mode possible of applying Captain Coles' shields to a ship is limiting the number of shields to two.[119]

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[119] *Ibid.*

IV. The spectre of modern coastal defence and assault

During this time when Coles' scheme of armament was gaining acceptance, though the conundrum of how to actually exploit its qualities was surfacing, events abroad reminded British naval thinkers of the traditional character of sea power. As warships of the Royal Navy were about to operate with a French squadron off the coast Mexico, ostensibly to collect on defaulted loans, the Foreign Office inquired of the Admiralty of "the probable success of a combined military and naval attack on Vera Cruz."[120] The two main concerns were the assault on the improved fortifications protecting the harbour and the "facilities or difficulties of a blockade of Vera Cruz and Tampico." The Admiralty replied that since the forts were "built of a sort of coral rock which receives a shot without suffering much damage", and armed with 68-pounder smoothbores of English or Belgian make, that "a force of two line of battle ships and three frigates or corvettes with four gun vessels armed with 100 pdr. Armstrong guns, would be the least that could be sent with the prospect of having to encounter a serious resistance on the part of the Mexicans. Looking to the probable composition of a Mexican garrison and the probable defective organisation of the defence my Lords believe that a well arranged attack by the above detailed force would have a good probability of success."[121] This was a sea-to-land ratio of almost 2-to-1 in guns, with the heaviest guns available necessary to demolish the Mexican ramparts. Most likely, a covering barrage would be laid down from a protective though ineffective distance by the ships-of-the-line and frigates, while the shallow gunboats moved in to deliver a precise, devastating fire. But this was against a bankrupt non-'Power' without a navy, or the resources to fully develop one.

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[120] ADM 1/5768, 4-9-1861. See also Thomas Schoonover, "Napoleon is Coming! Maximilian is Coming? The International History of the Civil War in the Caribbean Basin," in May, *The Union*, 101-130.
[121] ADM 1/5768, 4-9-1861.

A much more serious and complicated operation threatened in the following months during the *Trent* Crisis. Engaged in a continental-scale civil war, the United States nevertheless presented the Royal Navy with the gravest challenge it could imagine, despite *Blackwood's* confident assertion that "we shall assail their harbours, burn their fleets, destroy their commerce, and keep their whole seaboard in a state of constant alarm."[122] Unlike an assault upon French harbours or the maintenance of an effective blockade of the Atlantic and Mediterranean coasts of that nation, the logistical dimension alone of a war against the vast American eastern seaboard—on the far side of the Atlantic Ocean—was even more complicated in an age of steam-powered warships than in the wars of 1812 or the Revolution. Fuel was now a factor, supplied from the greatest of distances, along open-ocean routes subject to attack.[123] Effective convoy protection meant less ships available for blockade duty or the line-of-battle, let alone coastal defence for Britain against American privateers—while the ravages of the fast, heavily-armed Confederate cruisers (built and building in Great Britain) were about to demonstrate that steam power offered an even greater flexibility to commerce raiding. Coal could be taken from captured ships, purchased with confiscated goods, or seized from the many unprotected depots of the British Empire around the world. Naval resources would be stretched far greater against Civil War America than in a war against the more prepared but much more proximate French or even undeveloped though extremely distant China—or Mexico. A 14 December 1861 circular from Colonial Secretary Henry Pelham, the 5th Duke of Newcastle, "to the Governors of West India Colonies" thus warned that it would be 'impossible to increase the Land Forces now in the West Indies...for repelling any attack of a predatory kind from which no disposition of H.M.'s Naval Forces can give them absolute security." Local forces that could be scraped together by colonial

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[122] *Blackwood's Edinburgh Magazine*, February 1862, 228.

[123] During the *Trent* Crisis, the Royal Navy was quite aware that without coal there could be no operations against the United States, with reinforcing steam colliers delivering at least 10,000 tons to various American and West Indian Station outposts; see ADM 128/56, 6-12-1861; ADM 3/269, 6-12-1860; and ADM 1/5792, 16-12-1861.

LOOK OUT FOR SQUALLS.

Jack Bull. "YOU DO WHAT'S RIGHT, MY SON, OR I'LL BLOW YOU OUT OF THE WATER."

COLUMBIA'S FIX.

Columbia. "WHICH ANSWER SHALL I SEND?"

administrators would probably have to fend for themselves.[124] The old defences of Bermuda itself—Milne's chosen central base of operations—the British admiral found by the beginning of January 1862 to be "unstable and unsatisfactory…still mounting 24 pdrs. instead of those of the heaviest calibre." Although it "may be said to be no business of mine," Milne wrote to his superiors in London, "the Navy is looked to for the defence of the Island[;] indeed in its present state it would be impossible to leave it without Ships of War."[125] On the other hand, Russell specified to Somerset a "first anxiety" of safely reinforcing Canada "without being intercepted" and then securing British trade with large numbers of protective cruisers well before "we may consider aggressive operations."[126] Somerset for his part was concerned that "some disaster" in Canada was "not impossible in the event of war"; openly consulting the best authorities for its defence first, he wrote to Lewis, would at least pre-empt a likely public inquiry afterwards, "as we shall have abundant advice after the event, telling us what we ought to have done."[127] The bitter Crimean experience was still fresh in everyone's mind.

Yet the biggest problem facing British politicians and naval thinkers at the end of 1861 was not the defence of Canada, the maritime colonies, or the protection of trade, but laying down an offensive against the American coastline itself. If a maritime war with a continental power could be lost by England on the open sea lanes, it could only be won against the shores of the enemy.[128] Earlier that year a confidential printed report was circulated on what would be required for such a campaign. This was the *List of the Chief Ports on the Federal Coast of the United States, showing the Shipping, Population, Dockyards and Defences as far as known; also how far accessible or vulnerable to an Attack, as far as can be gathered from the Charts. With an approximate Estimate of the*

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[124] ADM 128/56, 14-12-1861.
[125] 2-1-1862, Milne to Somerset, SP.
[126] 28-12-1861, Russell to Somerset, SP.
[127] 5-12-1861, Somerset to Lewis, SP.
[128] Kenneth Bourne, *Britain and the Balance of Power in North America 1815-1908* (Berkeley: University of California Press, 1967), 206-47.

Number of Vessels required to blockade the several Ports and Rivers—a valuable expose of the British conception of blockade and assault existing in 1861.[129] It begins with the geographical setting. "The length of the seaboard of the United States, not including bays and rivers, from the eastern frontier in the Bay of Fundy to Cape Hatteras, south of the Chesapeake, is about 1,300 miles." By breaking this imposing stretch down the report optimistically denotes "seven principal ports and five secondary places, which it might be considered right to blockade." But in addition to the size of the task involved, there was the factor of time. Every day the resources of the North were being mobilised, and the defences of each place improved. Regarding Portland, Maine, for example, the entrance to the principal channel leading to within three-quarters of a mile to the city itself is listed as protected by two forts on either end of the approach, 1,000 yards apart, with a third fort building deeper in the centre, forming a triple cross-fire. It was a typical harbour defence leftover from the previous national coastal fortification program (which confronted so many Union planners throughout the Civil War), augmented by modern ordnance.[130]

If the channel was obstructed for the passage of deep-draught ironclads, however, or sown with torpedoes (mines), the attack could be quickly stalled under fire.[131] Perhaps it was for this reason that Milne "would rather have avoided or...felt my way at Portland, than at once adopting any active operations against that Town and State" in addition to

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[129] *List of the Chief Ports on the Federal Coast of the United States, showing the Shipping, Population, Dockyards and Defences as far as known; also how far accessible or vulnerable to an Attack, as far as can be gathered from the Charts. With an approximate Estimate of the Number of Vessels required to blockade the several Ports and Rivers* (London: HMSO, 1861); copy found in MP. Bourne identifies the author of the report as Captain John Washington, R.N., the Admiralty Hydrographer from 1855-62, Bourne, *Britain*, 240.

[130] MP, *List*, 1. See also Samuel J. Watson, "Knowledge, Interest and the Limits of Military Professionalism: The Discourse on American Coastal Defence, 1815-60", *War in History*, Vol. 5, No. 3 (1998).

[131] The *List* also warns "the blockading ships...must be on their guard against torpedos [sic], explosion vessels apparently laden with flour, but really with gunpowder, and other atrocious contrivances. The *Ramilies*, while lying here in June 1813, was nearly destroyed by one of these explosion vessels, fitted out by some merchants of New York; fortunately the vessel was not brought alongside, but one officer and 10 men fell victims to it," 5.

unrealistic British hopes that Maine would contemplate secession if Union leaders foolishly allowed the Civil War to escalate into a world war.[132]

Natural obstruction by ice was also a factor, and the greatest concern in the report is, of course, draft of water. Milne, for example, was alarmed to observe U.S. warships taking soundings at Bermuda and stressed the need for British ships to do the same in American ports while peace still remained.[133] In the case of Boston, *The List of Chief Ports* noted "the harbour is spacious and safe when once inside, but the entrances are intricate, with a depth of only 18 feet in some parts at low water, or 27 feet at high water." Furthermore, "all the forts looked new and in good order when seen last autumn. Fort Warren on George island is a double tier of casemates, probably with the American or small embrasure, faced with 8-inch wrought iron." Given this, the report was forced to conclude that "it is probable that Boston could not be attacked with any hope of success," although a blockade of the entrances to the city from the sea was possible with "at least...one line-of-battle ship, two frigates, two sloops, and two gunboats."[134] Indeed, it seems more likely that Milne preferred counter-blockade and a disruption of Union "communications" rather than "to make war felt" by carrying it out "against the Enemy with Energy, and every place made to feel what War really is."[135] This type of operational strategy was simply less risky than direct assault since it allowed the British to fight on "chosen ground" of their own: the open sea. Here, factors such as draft of water and natural or man-made obstructions could be safely and conveniently ignored; even "manoeuvrability" to a far greater extent.

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[132] 24-1-1862, Milne to Somerset, SP.
[133] ADM 1/5787, 31-12-1861.
[134] MP, *List*, 2-3.
[135] See Bourne, *Britain*, 237-44. Bourne concludes that "it was almost entirely upon the moral and military effectiveness of the blockade [of the Northern States] that all Great Britain's chances of success seemed to depend," 244.

The primary case in point in any proposed offensive operations against the United States was New York City, "the commercial capital of the United States, [with] a population of 600,000 [and] near one million tons of shipping." Likewise, however, the city's defences are listed in the survey as "10 or more forts and batteries," some of which carry "every modern improvement; the guns, too, no doubt are of heavy calibre." When questioning the "practicability or policy of an attack on the city of New York," the report continues, "there are so many circumstances to be considered that it might appear presumptuous, at present to offer any remark." But in a breathtaking scenario, the attack is indeed played out in the *List*—and "which is by no means recommended" in reality. Even if the gauntlet could be successfully run, "All that could be done then, would be to hold out the threat of bombarding the city unless the ships of war were surrendered and the Navy Yard destroyed":

> This measure might have the effect of putting an end to the war, and if so it might be worth the risk. But the risk would be too great if the intention transpired and time were allowed the enemy to make preparations. The only hope of success would be to obtain good local pilots beforehand, to appear off Sandy Hook by day-break, at half-flood tide, and to make a bold dash for 16 miles from sea to the quays of New York.[136]

There are weaknesses in the conception of the report itself. Laced with references to the deployments of the War of 1812, it often notes an effective blockade of a major port maintained by a single wooden man-of-war. Nor does it seem to take steam-powered blockade-runners into consideration, operating regardless of the wind. On Admiral Milne's copy of the *List*, the Commander-in-Chief of any probable naval war against the Union remarked that the proposed total number of warships outlined in the report ("6 Line-of-Battle, 11 Frigates, 23 Sloops, and 20 Gunboats") was "entirely inadequate". Reflecting after the immediate danger posed by the *Trent* Affair had passed, Milne wrote

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[136] MP, *List*, 7-8.

to Somerset that even the renowned steam-frigates of the *Orlando*-class—the British response to the pre-Civil War threat posed by the American navy's slow but powerfully-armed *Merrimack*-class steam-frigates—would "prove unsatisfactory to the service as Sea Boats, and will work themselves to pieces, nor can the rudder exert its power over them, the Leverage is too great and they fall off into the trough of the Sea." For littoral warfare, if not also blockade, the greater need was for paddle-steamers, the "most efficient and useful vessels for every service".[137]

The presence of steam-and-sail ships-of-the-line in American waters Milne meanwhile regarded as a positive drawback. This was dramatically underscored on 29 December 1861, when the 27-foot draft steam ship-of-the-line H.M.S. *Conqueror* mortally ran aground at Rum Cay, Jamaica.[138] By early March, Milne's opinions against them had crystallised. In a highly significant letter to Sir Frederick Grey he reflected:

> If it had been war the great want would have been Frigates and Corvettes. By my letter to the Duke you would see the large service I had in view, and the Line of Battle ships would never have stood the gales and sea off the American coast. Every one of them would have been disabled, in fact I don't see of what service I could have employed them. As to attacking Forts it must never be done by anchoring ships but by ships passing and repassing in rotation so as not to allow a steady object to the Enemy. Ships with larger draft of water are unfit for this mode of attack you need not build any more. Their days are numbered except [against] France...if she ever gets up a Navy.[139]

With frequent references to modern, heavy, shell-firing guns in networks of fortifications, the *List* relies in no small degree upon iron-plated frigates to make coastal assaults, let alone blockades, truly successful. The presence of "iron", as such, protected traditional

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[137] 24-1-1862, Milne to Somerset, SP. See also Milne's forwarded reports on various defects of vessels under his command in ADM 128/7, 21-3-1862. In contrast, Robinson, the Controller, did not see the need for building any more paddle steamers "for war purposes", nor even continue building unarmoured screw vessels," ADM 1/5802, 5-4-1862.

[138] See ADM 1/5787, 29-12-1861; also 17-1-1862, Milne to Grey, MP.

[139] 10-3-1862, Milne to Grey, MP; also 15-5-1862, Milne to Somerset, SP.

"wood" against modern ordnance. Whether this concern was well-founded is another matter, since at least American Civil War combat experience went both ways; some vessels were quickly devastated by close-range shell-fire, while others absorbed surprising amounts of punishment. What is certain, however, is that the added tactical risk of facing American ordnance necessitated the strategic presence of British ironclads. Even Palmerston was quick to point out to Somerset the desirability of sending either the old Crimean War ironclad batteries or the new armoured frigates (most of which were still under construction) since "the Americans put large Shell throwing Guns into all their Ships of War and our Ironsides would check mate such assailants." "It seems to me," the Prime Minister added at the height of the *Trent* Crisis, "that the only Danger we can have to apprehend from the American Navy would arise from their having armed their vessels with very heavy guns throwing large Shells, and being therefore Gun for Gun probably stronger than ours of similar classes." Two days later, Grey confirmed this opinion.[140]

Yet missing especially in late-1861 British plans for assaulting or even blockading the Northern States was a consideration of the possibility of ironclad vessels emerging from the harbours or inlets to challenge enemy ships, wood or iron, although *The List of the Chief Ports* does mention a large broadside-ironclad (U.S.S. *New Ironsides*) building at "the private shipyard of Messrs. Cramp & Son...for the use of the United States Government", and to be "ready for sea by the middle of July 1862."[141] On 3 December 1861 the Foreign Office also transmitted to the Admiralty a copy of the *New York Herald* (dated 11 November) which noted the second of the three ironclad prototypes approved by the Union Navy's Ironclad Board of 1861, the *Galena*, an important token of "the many improvements and the ideas that will be gained by experience" which would allow

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[140] 6-12-1861 Palmerston to Somerset; and 28-12-1861, Palmerston to Somerset, SP. See the collection of reports on "New Scheme of Armament for H.M. Ships, in consequence of Introduction of Armstrong Gun" in ADM 1/5792.
[141] MP, *List*, 9.

the Union Navy "to cope with any of the boasted navies of Europe."[142] But how would the Royal Navy in turn cope with Federal ironclads?

Another important reference which the *List* makes when discussing the armament of Fortress Monroe, but does not weigh accordingly, is of "a 15-inch gun, named Rodman's gun, cast at Pittsburg, on the Ohio, (300 miles west of Philadelphia) which throws a solid shot of 420 lbs. weight, and the bursting charge of its shell is 16 lbs. of powder. Weight of gun nearly 22 tons."[143] For the next four years this massive-calibre weapon, the main armament for most of the U.S. monitors constructed during the Civil War, would earn a reputation for smashing 4- to 6-inch laminated (though inclined), rolled armour plating. It was the nightmare of wooden warships falling prey to shell-firing guns writ large for early British ironclads.

Summary:

It was difficult to establish first, what Britain's overall strategic objectives were concerning the role of the Royal Navy by the 1860s, and second, how those objectives were to be met by various—and opposing—types of armour-plated warships. The traditional response to French challenges was to out-build them, ship for ship, perhaps also achieving a qualitative as well as quantitative edge. Yet the advent of ironclad-frigates complicated this formula. It was not seen as possible to reconcile full armour protection with the greatest tactical speed and strategic range in one design. There

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[142] ADM 1/5768, 3-12-1861. Lyons also forwarded to Lord Russell at the Foreign Office the 5 December *Daily Globe*'s full reprint of the U.S. Secretary of the Navy's Annual Report to Congress of 2 December 1861, listing 3 ironclads under construction; ADM 1/5768, 26-12-1861.
[143] MP, *List*, 10.

would have to be some compromise. The Royal Oak*s thus represented an acknowledgment that regional supremacy, based on more fully-protected ironclads of at least equal numbers to French varieties, was more important than high seas or imperial supremacy. Meanwhile, a Colonial Office memo observed that "the Colonies, especially the lesser Colonies which most call for assistance, are not separate nations; they are members of one immensely powerful and wealthy nation, from which they believe that they are entitled to some share of general protection. The question is what that share should be."*[144]

Even when the Board of Admiralty decided to push ahead with super iron-hulled Warriors *in the form of the* Achilles *and then the* Minotaur*-class ironclads it became doubtful whether British private industry and shipbuilding would be able to meet the new demands of the Royal Navy. Somerset complained that a Committee on Dockyard Economy unfairly concluded "that the Dockyards will not bear comparison with the private establishments of the day."*[145] *If anything, the need for more comprehensive strategic protection, as well as tactical protection in the shape and form of ironclads themselves, required equally greater consolidation of modern shipbuilding in the dockyards, under tighter government control, than otherwise. This would be an expensive undertaking, and did not sit well with Liberal drives for retrenchment; hence the appeal of Coles in providing the "most economical ship" which would also be the "most invulnerable and the most durable"—though his system of turret-ship conversions of steam ships-of-the-line could really only offer "National", as opposed to Imperial, defence.*[146]

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[144] 28-1-1860, Colonial Office memo, written by T. Frederick Elliot, dissenting from a recent Report on military expenditure on the Colonies; WO 33-09, 3.
[145] February 1860 printed memo, Somerset to Board, ADM 1/5741, 12.
[146] Cowper Phipps Coles, *Shot-Proof Gun-Shields, as Adapted to Iron-Cased Ships for National Defence*, pamphlet reprinted from the *Journal of the Royal United Service Institution*, Vol. 4, 1860, from his lecture dated 29-6-1860 (Westminster: J. B. Nichols and Sons, 1860), 12.

What caught the British Empire in the proverbial flank—obsessed as it was with the recent French challenges to its naval supremacy—was the prospect of hostilities against the Northern States at the beginning of the American Civil War. By then it was already questionable whether steam power entailed a greater economy of resources for modern naval operations or had in fact made them much more difficult and expensive. Added to this was the relative efficiency of blue-water, battlefleet warships for close blockade work against the treacherous American coastline. Coastal or harbour assault itself Admiral Milne discounted as too risky, depending as it did upon Union defences not being ready in time. Though the naval and military build-up during the Trent *Crisis would succeed in convincing Washington that the Union was indeed not prepared by the end of 1861 for a hostile dose of British seapower, it also stressed to British authorities just how perilously transitional that force had become.*

V. Two ironclad adversaries: the Confederacy and Great Britain

The creation of the ironclad navy of the United States was directed against two adversaries; one actual, and one potential; the Confederate States, and Great Britain. Before the Civil War erupted in America, with the bombardment of Fort Sumter on 15 April 1861, few U.S. naval authorities gave the matter serious thought. In the beginning of 1860, *Scientific American* bemoaned the fact that "at present we have not a single first class war steamer—one that can compete with the most recently built French and British ones, and we regret that the Secretary of the Navy has not paid attention to these—we mean the iron-cased war wolves."[147] Indeed, Secretary Isaac Toucey's Annual Report in question (1 December 1860) stated that "to arm a ship of war without a modern patented invention would give great advantage to the enemy," but nowhere mentioned the phenomenon of armour-plating men-of-war occurring across the Atlantic. Instead, he "earnestly" recommended "the policy of a gradual, substantial, and permanent increase of the Navy, accompanied by the universal introduction into it of the motive power of steam." There were important contemporary issues involved. Since the U.S. Constitution prohibited states from developing navies of their own—creating yet another potential source of complaint for advocates of "States' Rights"—it was even more imperative for Congress "to provided and maintain a naval force adequate to our [national] protection."[148]

Probably no other American naval officer was better qualified to offer an opinion regarding ironclads than Commander John A. Dahlgren. Already famous for the widespread adoption of his shell-firing 'bottle-shaped' heavy smoothbore cannon in the U.S. Navy, Dahlgren had also established himself as an authority on contemporary naval

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[147] 12-1-1860, *Scientific American*, 25.

[148] 36th Congress, 2nd Session, Senate Executive Document No. 1, Vol. 3 (Washington: GPO, 1860), *Message from the President of the United States; Report of the Secretary of the Navy*, 1-12-1860, 3-5.

strategy and tactics with his treatise on *Shells and Shell-Guns*, published in 1857. This included a detailed analysis of the Crimean War, which Dahlgren suggested pointed to the superiority of the steam-powered vessel over forts, especially when running gauntlets of fire. It also demonstrated, at Kinburn, the value of impregnable floating batteries, at least "as auxiliaries in attacking shore works".[149] On 10 December 1860, Dahlgren, as Commander in charge of the Ordnance Department at the Washington Navy Yard, wrote to Captain George A. Magruder, the Chief of the Bureau of Ordnance and Hydrography, that "the earnest attention now given by naval authorities to the armature of ships-of-war, and the enormous expenditure which England and France are incurring in building ships of this description, induce me to recall the attention of the bureau to the suggestions made by me on this subject several years ago." Dahlgren recognised from successful tests of his 9-inch shells against wooden targets in 1852 that "the sides of a vessel may be protected by iron frames or plates as to make it nearly certain that shells will break by impinging them." But permission was not given at the time to conduct armour plate tests of his own.[150]

By 2 February 1861, Dahlgren was writing to Senator James Grimes of Iowa, Chairman of the U.S. Senate Naval Committee, it was "advisable that the construction of some armored Gun Boats should be proceeded with." But this should not be "to the exclusion of at least the one heavy frigate" which Dahlgren specified as a ship "of 5000 to 6000 Tons", and which "may cost 1¾ to 2 millions which is the estimated expense of the English Plated-frigate *Warrior*, just launched—$500,000 will do to begin with." Haste was needed, "for with all effort it would not be possible to get a ship ready for service in less than two years." This was unusual, since the previous month he informed the House Chairman of Naval Affairs that "Gun Sloops [were] a class of vessel more needed in the

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[149] J. A. Dahlgren, *Shells and Shell-Guns* (Philadelphia: King & Baird, 1857), 412-5.
[150] 10-12-1860, Dahlgren to Magruder, DP; also 4-5-1861, *Scientific American*, 274.

Navy than any other"—if an ironclad were to be considered—suggesting the recent *Iroquois*-class as a model to be plated.[151] What was a long-range, ocean-going ironclad needed for? The ordnance expert did not specify, but noted instead an inquiry "from one of our most eminent private Ship Builders" (Donald McKay, of Boston) on armament schemes for various classes of ironclads. "Unless Government acts promptly," Dahlgren cautioned, "it will be anticipated by private enterprise." Presumably, this would be a fate worse than falling behind England or France. Nevertheless, in response to Donald McKay's inquiry, Dahlgren had to "regret to perceive that this Congress is not likely to make any appropriation for constructing an Iron plated ship."[152]

With a civil war looming, it was difficult to determine what kind of naval force would be needed to protect, if not preserve, the Union. The U.S. Navy's instincts were blue-water; the disposition of its existing warships, protecting far-flung American commercial interests, was proof of that. The initial public and professional reaction to European ironclad programs was to meet them on similar terms, differences in broadside armament notwithstanding. John Lenthall, Chief of the Bureau of Ship Construction and Repair, therefore rejected many early proposals coming into the Navy Department, typically because "the necessarily large size, the cost and the time required for building an iron cased steam vessel is such that it is not recommended to adopt any plan at present."[153]

Yet opinion across the Atlantic was not so clearly united. "We cannot, with our wide-spread dominions, or colonies and commerce dotted all over the surface of the globe, expect to be superior at every assailable point," argued *Blackwood's* in March 1861, "and we should utterly fail if, in the event of war with a great maritime power, we attempted to

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[151] 11-2-1861, Dahlgren to Grimes; 19-1-1861, Dahlgren to Morse, DP. See also Donald L. Canney, *The Old Steam Navy, Volume Two: The Ironclads, 1842-1885* (Annapolis: Naval Institute Press, 1993), 7.
[152] 11-2-1861, Dahlgren to Grimes; 20-2-1861, Dahlgren to McKay, DP.
[153] Quoted from Baxter, *Introduction*, 242.

be everywhere in force at the same time—a strategy which seems to be indicated by the powerful efforts made to produce that marine impossibility, great fighting-power and great speed." Instead, Britain should have "a number of iron-clad vessels for the defence of our coast and narrow seas. Let them be capable of going as far as Brest or Cherbourg on the one hand, and Antwerp, Rotterdam, or Copenhagen on the other."[154]

For Gideon Welles, the new Secretary of the Navy coming to office during a civil war, "the necessity of an augmentation of our navy in order to meet the crisis...was immediately felt, and a class of vessels different in some respects from any that were in service, to act as sentinels on the coast, was required."[155] These 23 purpose-built, wooden-hulled, screw-driven steamships were later nicknamed the "90-Day Gunboats", for their speed of construction. They could operate in shallow draft, and mounted a heavy 11-inch Dahlgren smoothbore pivot. Already, the appropriations voted to the end of the fiscal year (30 June 1862) had jumped during the secession crisis—before Congress could approve—from $13,168,675 to $30,609,520, including the purchase or charter of 21 steam and 3 sailing merchant vessels. But although "much attention has been given within the last few years to the subject of floating batteries, or iron-clad steamers" (surely the ultimate sentinels on the coast), Welles doubted whether "the period is perhaps not one best adapted to heavy expenditures by way of experiment and the time and attention of some of those who are most competent to investigate and form correct conclusions on this subject are otherwise employed." Still, he recommended the appointment of a special board to report on "a measure so important".[156]

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[154] March 1861, *Blackwood's Edinburgh Magazine*, 311, 316.

[155] 7-4-1861, Report of the Secretary of the Navy, 90.

[156] Report of the Secretary of the Navy, 96. Captain Gustavus Vasa Fox, also the newly-appointed Assistant Secretary of the Navy, testified before the Joint Committee on the Conduct of the War on March 19, 1862 that "this matter of iron-clad vessels was brought up by the department a year ago, and Congress was asked for an appropriation of $50,000 in July to test the different kinds of plating, which was refused. We went to the President and he held a meeting at General [Winfield' Scott's office, and we were authorized to go ahead, without waiting for Congress, and make these iron plates. But when we came to call for proposals, which we did without authority from Congress, we ran against this difficulty—that there

Within weeks at least two important contenders for contracts for ironclads, Donald McKay and Cornelius Bushnell, were writing to Commodore Joseph Smith, the Head of the Bureau of Yards and Docks regarding any decisions on a Union program for their construction.[157] Finally, on 3 August 1861, by an Act of Congress, Welles was directed "to appoint a board of three skilful naval officers to investigate the plans and specifications that may be submitted for the construction or completing of iron-clad steamships or floating batteries to be built," appropriating $1,500,000 for the purpose. At the time this was equivalent to £300,000, the rough price of a single *Warrior*.

Whether the Union would invest in such an "iron-clad steamship" *or* "floating batteries", however, was unclear. As J. P. Baxter noted, even getting Welles' proposal for an Ironclad Board through Congress was not an easy affair, despite the grandiose vision (and therefore naval requirements) of the well-publicized "Anaconda Plan"[158] and the emerging reports that the rebels at Norfolk had salvaged the wreck of the *Merrimack*—to convert her into a powerful ironclad of their own. A House amendment to Senator Grimes's 19 July bill for an Ironclad Board nearly made completion of the abortive Stevens Battery a condition for the special $1.5 million appropriation since the Senate opposed this. Referring back to the Navy's strategic requirements, Grimes argued "it was supposed to be possible that a conflict with some foreign Power might grow out of our present complications..." Moreover, "in that event it might be important to provide armored batteries, floating steam batteries, for the defense of the various harbors along

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was a limit to the making of these vessels. There is no preparation for making the plates in this country, except by forging them, which is altogether too slow and tedious for the necessity. There is but one rolling mill in the country that can make the plates by rolling, and that is the one that made the plates for the Monitor," *Report of the Joint Committee on the Conduct of the War*, 3 vols., 37th Congress, 3rd Session, 1863, "Monitor and Merrimack", 3: 416.

[157] See 24-7-1861, McKay to Smith, and 25-7-1861, Smith to Bushnell, RG 45, Entry 464, Box 49.

[158] Formulated by General Winfield Scott at the beginning of the Civil War, the Union's derisively nicknamed "Anaconda" would (too) slowly strangle the Confederate States into submission with a continental scale blockade, while Union land and naval forces further cut off the South, East from West, by gaining control of the Mississippi River.

our sea-coast." These statements more clearly reflected the national resentment with England's neutrality—the threat of recognition of the Confederacy and an ensuring Anglo-American maritime war—Lincoln's perception of the global political and social significance of the Civil War; and Welles' "immediately felt" need for a brown-water naval force. "The sole purpose of this bill," Grimes acknowledged, "is to enable the Secretary of the Navy to construct some floating steam batteries that can take position on either side of a harbor, or in the center of a harbor, to resist the ingress of vessels of war."[159]

The story of how civilian engineer-inventor John Ericsson entered into the scene at this point has been well told many times before. During the Crimean War, Ericsson submitted plans for an "Iron-Clad Steam Battery, with Revolving Cupola" to Napoleon III. This was essentially a monitor. In his proposal to the French Emperor, dated 26 September 1854, Ericsson declared that "the present system of *long* range is abortive" in naval combat tactics and technology. Smaller, rifled projectiles lacked sufficient weight and therefore hitting power; while "accurate aim at long range becomes absolutely impossible in practice." What was needed therefore was a "complete system of *naval attack*" with a "self-moving vessel capable of passing within range of guns and forts, and of moving at pleasure in defiance of the fire of broadsides." Yet despite its amazing inherent defensive powers (low freeboard and "semi-globular turret of plate iron 6 inches thick"), and the concentrated, all-powerful armament scheme—what torpedoes would be for submarines in the following century—Ericsson's dream-ironclad lacked auxiliary sail power, extra coal bunkers, or some equally revolutionary form of super-efficient steam engine.

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[159] Quoted from Baxter, *Introduction*, 246, ff.1.

Though it would "place an entire fleet of sailing vessels, during calms and light winds, at the mercy of a single craft", this was implicitly a *coastal* system of naval attack.[160]

Ericsson was originally called upon by Bushnell to inspect the latter's own plans for an ironclad which he intended to submit to the Ironclad Board of 1861 (which consisted of Commodore Smith, Commodore Hiram Paulding and Commander Charles H. Davis). This vessel, later to become the U.S.S. *Galena*, was largely approved by Ericsson, who then revealed to Bushnell in the form of plans and a cardboard model complete with a revolving turret his own conception of a "perfect ironclad". Bushnell, immediately intrigued, pressed Ericsson to submit the design to the Board, and then gained the stubborn and doubtful inventor's permission to bring it to Washington for him. On 29 August 1861 Ericsson drafted a letter to Lincoln seeking "no private advantage or emolument of any kind" for his ironclad proposals, since a thousand of his caloric engines already provided him with enough personal means. "Attachment to the Union alone," he declared, "impels me to offer my services—my life if need be—in the great cause which Providence has called you to defend." His battery could within 10 weeks "take up position under the rebel guns at Norfolk and…within a few hours the stolen ships would be sunk and the harbor purged of traitors." Ericsson concluded by drawing the President's attention to the "now well established fact that steel clad vessels cannot be arrested in their course by land batteries". New York was therefore "quite at the mercy of such intruders, and may at any moment be laid in ruins"—unless the Union possessed ironclads impervious to Britain's "Armstrong Guns" and were armed in turn with armour-crushing ordnance.[161] Meanwhile, on 3 September, Merrick & Sons of Philadelphia proposed to Welles "an iron plated steamer" taking nine months to build at a cost of

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[160] "Of what avail would be the 'steam guard-ships' if attacked on the new system? Alas! for the 'wooden walls' that formerly 'ruled the waves.' The long-range Lancaster gun would scarcely hit the revolving turret once in six hours, and then, six chances to one, its shot and shell would be deflected by the varying angles of the face of the impregnable globe," quoted by Ericsson from his original proposal in John Ericsson, *Contributions to the Centennial Exhibition* (New York: The Nation Press, 1876), 410-16.

[161] 29-8-1861, Ericsson to Lincoln, EPPA.

$780,000. This would be eventually accepted as the U.S.S. *New Ironsides*, the Union Navy's only serving seagoing broadside-ironclad.

Yet Welles also saw merit in Ericsson's model, which Bushnell displayed for the Secretary at his home in Hartford, Connecticut directly after his meeting with Ericsson. Encouraged by this response, Bushnell then hurriedly solicited the backing of New York iron industrialists John F. Winslow and John A. Griswold, who also had influential connections with former State Governor William H. Seward, now the influential Secretary of State. By 7 September Bushnell was writing from Willard's Hotel in Washington to Cornelius Delamater of the Novelty Iron Works of New York (who had originally referred Bushnell to Ericsson for professional scrutiny of the *Galena*'s stability) with good news. Ericsson's plan "was formally laid before the President last Evening—on an introductory letter from Mr. Seward." Lincoln, he reported, was "much pleased"—even so far as to make an appointment to accompany Bushnell and the "Ericsson Battery" before the Ironclad Board.[162]

Perhaps the presence of so much civilian authority went too far to pressure the naval professionals in charge, however. Ericsson's name also evoked bad memories of the U.S.S. *Princeton*'s "Peacemaker" gun disaster of 28 February 1844. The *Princeton* was the world's first screw-propelled frigate, designed and engineered by Ericsson, but the "Peacemaker" was that of his Navy advocate, Captain Robert F. Stockton. When the gun exploded in a celebrated trial, killing the Secretary of State, the Secretary of the Navy and others, as well as wounding several more (including Stockton himself), Ericsson soon found his own professional reputation tarnished. Worse still, his subsequent labour bill to the Navy of $15,000 for work on the *Princeton* was flatly rejected by Stockton, as was Ericsson's connection with the vessel as being on anything but a "volunteer" basis. In

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[162] 7-9-1861, Bushnell to Delamater, EPPA.

Stockton's version of events, Ericsson had come uninvited to America from England, and then built the *Princeton* for free. His bill was never paid.[163] At any rate, all of the board members were naturally conservative to such a radical departure from conventional ship design, Commander Davis contemptuously advising Bushnell to "take the little thing home and worship it, as it would not be idolatry, because it was in the image of nothing in the heaven above or on the earth beneath or in the waters under the earth."[164]

Dismayed but not dispirited, Bushnell returned home to New Haven, informing Ericsson on 11 September that Welles would "be pleased to see your plans and have the same adopted at once if you can secure the approval of the Board" which Ericsson would—keeping to Davis's own religious allegory—need to "convert".[165] Accordingly, Ericsson proceeded to Washington where he heard with indignation the naval officers' doubts of his proposed vessel's stability. In a par-deluxe display of instructional presentation and salesmanship, Ericsson proceeded to convince the Board of his extraordinary grasp of the laws of physics, and his equally stunning ability to translate them into sound mechanical principles. Science was Ericsson's religion, and none of the Board members were able to deny that modern warfare was headed in this direction. "Gentlemen, after what I have said," Ericsson concluded, "I deem it your duty to the country to give me an order to build the vessel before I leave the room."[166]

When the Ironclad Board of 1861 at last reported its findings to Gideon Welles, on 16 September, the Secretary of the Navy must have found their opening remarks discouraging. The "three skilful naval officers" doubted their own ability to address such a novel topic, "having no experience and but scanty knowledge in this branch of naval

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[163] William Conant Church, *The Life of John Ericsson*, 2 vols. (New York: Charles Scribner's Sons, 1890), 1: 92-6; 101-9; 117-51.
[164] Church, *Life of Ericsson*, 1: 250.
[165] 11-9-1861, Bushnell to Ericsson, EPPA.
[166] Church, *Life of Ericsson*, 1: 253.

architecture."[167] Indeed, iron armour properties, experimental ordnance, and steam power seemed to be areas reserved more for engineers and inventors, not professional sailors. Though an application "was made to the department for a naval constructor...with whom we might consult...it appears that they are all so employed on important service that none could be assigned to this duty." One thing, however, was certain, almost to the point of understatement: "Opinions differ amongst naval and scientific men as to the policy of adopting the iron armature for ships-of-war." Specifically, was it better to invest in "ships" or "batteries"? The Board's response to this central question was momentous:

> The enormous load of iron, as so much additional weight to the vessel; the great breadth of beam necessary to give her stability; the short supply of coal she will be able to stow in bunkers; the greater power required to propel her; and the largely increased cost of construction, are objections to this class of vessel as cruisers which we believe it is difficult successfully to overcome. For river and harbor service we consider iron-clad vessels of light draught, or floating batteries thus shielded, as very important; and we feel at this moment the necessity of them on some of our rivers and inlets to enforce obedience to the laws.

Already, the Union Navy was turning away from a blue-water conception of naval power to a brown-water one.[168] But there were limits here as well. The Board felt that "no ship or floating battery, however heavily she may be plated, can cope successfully with a properly constructed fortification of masonry."[169] This too would prove to be an important observation. "Armored ships or batteries may be employed advantageously to pass fortifications on land for ulterior objects of attack, to run a blockade, or to reduce temporary batteries on the shores of rivers and the approaches to our harbors."

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[167] Curiously, Dahlgren declined to serve on the Board with Commodores Joseph Smith and Hiram Paulding; Baxter, *Introduction*, 247.

[168] As Donald Canney observes, however, the Navy's 7 August 1861 advertisement for ironclad submissions specified "not less than ten or over sixteen feet draught of water," *The Ironclads*, 8-9. Naval constructor Samuel Pook noted there was "an advantage in the use of small vessel for lightness of draught to carry a heavier armament in proportion to their dimensions, and the increased cost of construction," 12-11-1861, Pook to Smith, RG 45, Entry 464, Box 49.

[169] 16-9-1861, Ironclad Board to Welles, RG 45, Letters Rec'd.

As for ironclad ordnance, the Board acknowledged the great range of rifled guns, but "as yet we know of nothing superior to the large and heavy spherical shot in its destructive effects on vessels, whether plated or not." Though rifled guns enjoyed greater range, "the conical shot does not produce the *crushing* effect of spherical shot." This obviously echoed Dahlgren's conclusions. Armour plate itself should be "of tough iron, and rolled in large, long pieces" and probably backed by "some elastic substance (soft wood, perhaps is the best)" which "might relive the frame of the ship somewhat form the terrible shock of a heavy projectile, though the plate should not be fractured." Since there were no facilities in America for rolling (rather than hammering) plates in the standard 4½-inch thicknesses of Europe, the Board also considered the possibility of contracting for ironclads in England. Yet "a difficulty might arise with the British government, in case we should undertake to construct ships-of-war in that country, which might complicate their delivery; and, moreover, we are of opinion that every people or nation who can maintain a navy should be capable of constructing it themselves."[170] Either the Union would find the means—and the time—to invest in machinery and infrastructure to produce such armour on an equal scale, or another scheme would have to be found making the best of the nation's existing resources.

In the meantime, the Ironclad Board concluded, "our immediate demands seem to require, first, so far as practicable, vessels invulnerable to shot, of light draught of water, to penetrate our shoal harbors, rivers, and bayous...The amount now appropriated is not sufficient to build both classes of vessels to any great extent."[171] As a result, three contracts were awarded: to Bushnell, for the *Galena*; to Merrick & Sons, for the *New Ironsides*; and for Ericsson's *Monitor*, which seemed even at this stage in the Union Navy's ironclad program to meet the needs for the Union's coastal and river operations,

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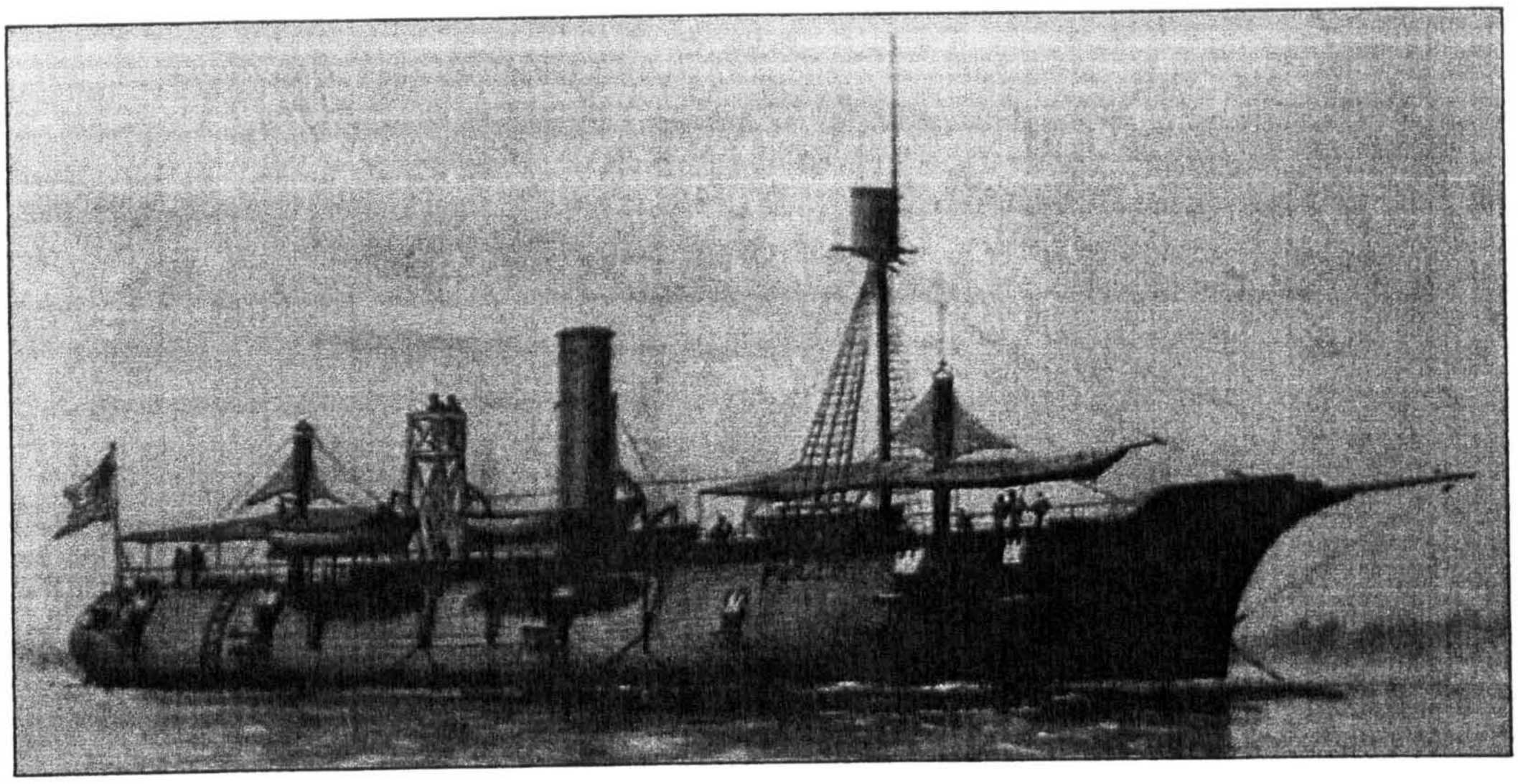
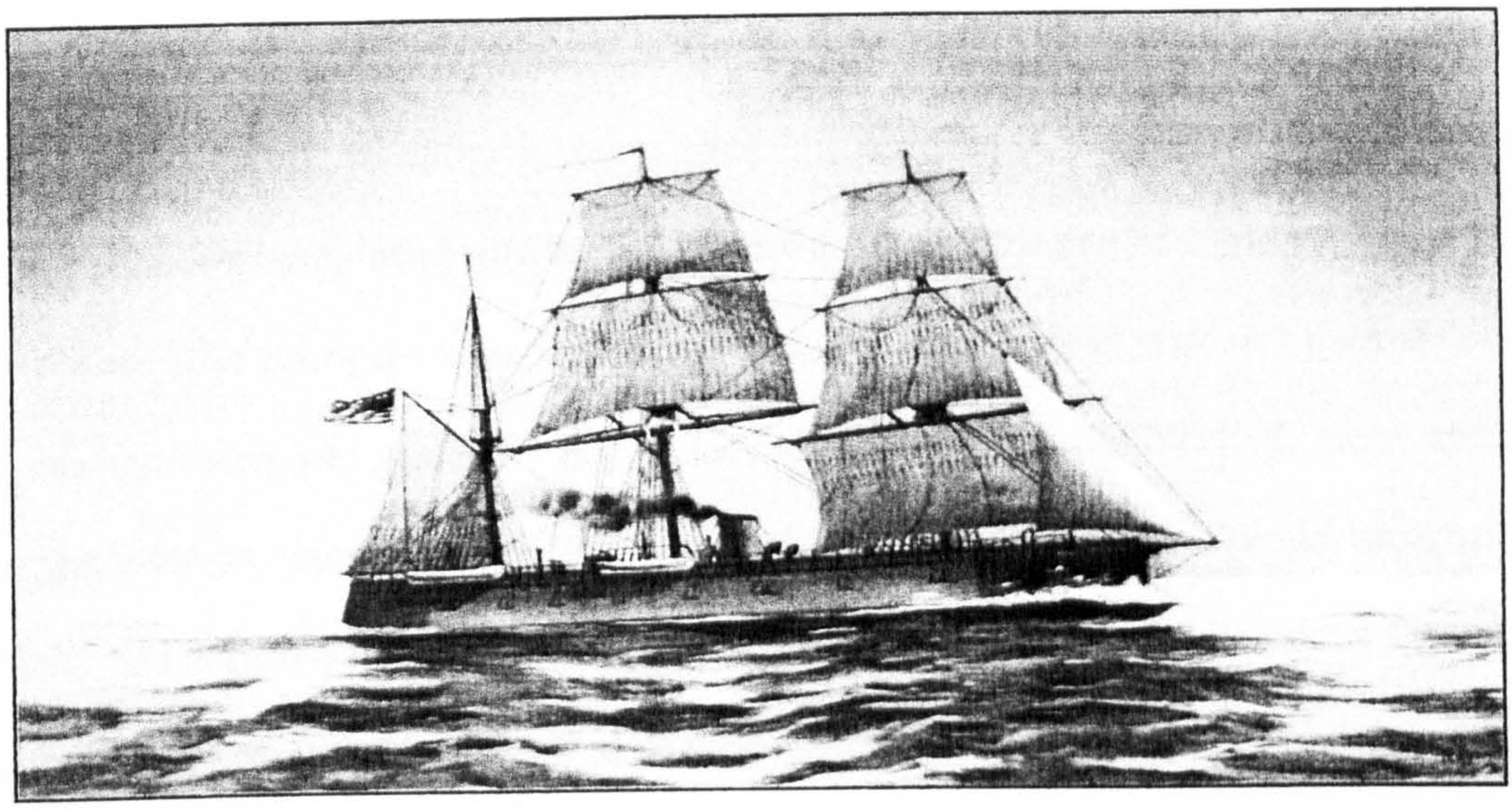
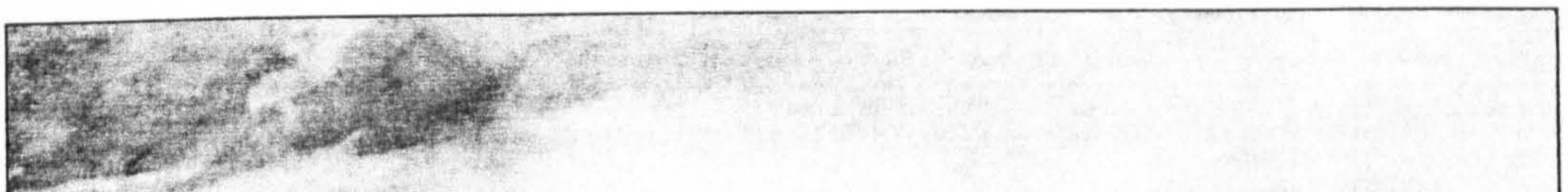
[170] 16-9-1861, Ironclad Board to Welles, WP.
[171] *Ibid.*



U.S.S. *Galena* (*ORN*)



U.S.S. *New Ironsides* (*ORN*)



U.S.S. *Keokuk* (*ORN*)

for at least the domestic purposes of the Civil War. That such a turreted, coastal defence ironclad could make headway at all with the U.S. Navy in 1861 reflects more perhaps on the contingency of the Civil War itself, rather than a rejection of its Blue-Water instincts. There was no guarantee, indeed, that Congress would be willing to invest in a wide-ranging ironclad force to "compete" with England or France after the war. Given past tendencies, in fact, this must have seemed highly unlikely. But in 1861, especially after the 1st Battle of Bull Run, there was no guarantee that the war could even be won by the Union either. By the end of the year, it would be doubtful whether the war could be contained.

What is often overlooked in this story, however, is the implicit role of Ericsson's ironclad battery, the famous *Monitor*, in relation to British—not Confederate—naval power. Already the overriding need was for light-draught, steam-powered men-of-war during the Civil War. The European ironclad examples could not be taken seriously until at least coastal hegemony was assured. But in addition to enforcing the blockade from within was the need to protect it from outside, intervening naval forces. Europe, especially Britain, had a vested interest in the Union blockade of the South. This was, in fact, the Confederacy's greatest hope and best chance for national independence, just at it was for the original Thirteen Colonies struggling against Britain during the Revolutionary War. On 21 May 1861 Seward wrote unofficially to Adams in London, that "British recognition would be British intervention, to create within our territory a hostile state by overthrowing this Republic itself." The result would be a world war "between the European and the American branches of the British race."[172] Two months later he informed him that Union leadership understood and accepted the precautionary measures undertaken by Britain to protect its interests in North America; namely, the dispatch of

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[172] George E. Baker (ed.), *The Works of William Seward*, 5 vols. (Boston: Houghton, Mifflin and Company, 1884), 5: 244-5.

three regiments to Canada and additional warships to the British West Indies and North American Station. Indeed, "On our part the possibility of foreign intervention, sooner or later, in this domestic disturbance is never absent from the thoughts of this government." It was precisely because of this fear that Seward was adamant of the danger of British recognition of the Confederacy. An Anglo-American war, necessarily a maritime one, would involve, "scenes of devastation and desolation which will leave no roots remaining out of which trade between the United States and Great Britain, as it has hitherto flourished, can ever again spring up."[173]

Hence, when Cornelius Bushnell, Ericsson's earliest backer, first exhibited the *Monitor* plans to Secretary Welles in early September 1861, he announced that an anxious President Lincoln "need not further worry about foreign interference; I [have] discovered the means of perfect protection."[174]

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[173] *Ibid.*, 280-6.

[174] James Tertius DeKay, *Monitor: The Story of the Legendary Civil War Ironclad and the Man Whose Invention Changed the Course of History* (Pimlico: Random House, 1999), 73. DeKay deduces 20 September as the date of his initial presentation of Ericsson's monitor-model at Welles' house, but this is well after the report of the Ironclad Board itself. 5 September is therefore more likely; see Church, *Life of Ericsson*, 1: 249; Canney, *The Ironclads*, 25. John Murray Forbes also noted to Fox his "original idea with which I have bored you so much & which I broached to the President in April 61 that the sea belongs to us, & ought to be made our chief dependence for putting down the Rebels & keeping the foreign bull dogs peaceable," 19-11-1862, Forbes to Fox, FP.

VI. Building the *Monitor*

Ericsson was officially notified of the *Monitor*'s acceptance by the Ironclad Board on 21 September 1861. The contract itself was not agreed upon, however, until 4 October. Still not completely satisfied with its decision, the Ironclad Board members demanded Ericsson's battery prove itself in combat before its full price was reimbursed to the contractors. Though his partners Bushnell, Winslow and Griswold thought this irregular and offensive, Ericsson himself found it "perfectly reasonable and proper." "If the structure cannot stand this test," he wrote to Smith, "then it is indeed worthless."[175] Bushnell wanted the promised date of completion modified to include "such time as she can be fairly tested under the enemy's fire." This was not asking for much, he argued. In terms of "National defense", "the whole vessel with her equipment will cost no more than to maintain one regiment in the field 12 months, and each are experiments to be used to save the Government and Union; should ours prove what we warrant it, will it not be of infinitely more service than 100 regiments?"[176] Winslow in turn was optimistic about completing the vessel in the promised "100 days", though in the winter shipbuilding season these would be necessarily "short ones—and few enough to do all that is to be done..."[177]

But this was only the beginning of Ericsson's problems. On 25 September Commodore Smith was already expressing worry that "the concussion in the Turret will be so great that men cannot remain in it and work the guns after a few fires with shot." Ericsson replied his "long drilling in the army" made him "perfectly familiar with the effect produced by firing heavy ordnance in close chambers." If the turret were in a semi-globular form, the gunners "would be stunned as if struck by lightning." But the

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[175] 2-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.
[176] 4-10-1861, Bushnell to Smith, RG 45, Entry 464, AD, Box 49.
[177] 9-10-1861, Winslow to Ericsson, EPPA.

Monitor's cylindrical turret was perforated on top, 9-feet high and "so thick it will not vibrate". The vessel's forced air draft and positive air pressure from steam-powered blowers would also alleviate this concern. Indeed, "it will be comparatively a luxury for gunners to stand on the open grating of my turret, to standing on the gun deck of a frigate during action: more air, less smoke and greatly diminished vibration overhead."[178] Nor was Ericsson prepared to submit finished designs for the battery in question. The genius-inventor was, in essence, making it up as he went along; building by day, planning by night, adapting to varying circumstances often beyond his control.

The armour scheme for the *Monitor*'s turret was—and perhaps remains—a controversial case in point. Widely publicized British tests had determined that thin layers of iron plate did not offer the same resistance to shot and shell as a single, homogenous plate of equal overall thickness. Furthermore, plates backed by an "elastic" substance, which helped to absorb shock waves generated by the impact of projectiles, were less prone to penetration or fracturing. Well-versed in the latest published theories, combined with his own understanding of physics, chemistry and engineering, Ericsson originally proscribed a single rolled 4-inch plate, backed by four layers of 1-inch plates to act as a cushion. These were all carefully overlapped to "break-joint", since the junctures of armour-plates were definite weak points.[179] On 4 October Ericsson wrote to Smith of his "expectation of obtaining rolled plate 4 inches thick to form the outer half of the turret, the inner half being composed of lighter plate riveted together..." But within a week he wanted to amend the contract, granting him "the authority to select either of the two modes specified of plating turret and the vessel's sides" since "Mr. Abbott of Baltimore states he will require full two months preparation to roll 4 inch thick plates," and "other

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[178] 25-9-1861, Smith to Ericsson, EPPA; 27-9-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.
[179] In that sense at least, overlapping, "laminated"-type armour was less vulnerable than rows of solid slab-plates butted against each other, or interlocked by "tongue and groove" fittings, as with the British *Warrior* and *Defence*-classes, and the Union's *New Ironsides*.

establishments have not given a positive reply." Expediency of the precious contract, as well as the urgency of the Civil War, led him to adopt 8 layers of 1-inch plates, since these he could have "at once, 5 feet square, at the rate of 140 tons per week."[180] Yet Ericsson was, for the moment, satisfied with this concession. "We are not going to fight the steel clad vessels of Europe at present, and for home use the four inch plating sustained by 40 feet of deck, and the end of 10 inch deck beams of oak, will be more than sufficient."[181]

Another concern was the system of armament. Not only did Ericsson prefer the smashing power of heavy smoothbores at close ranges, like Dahlgren and other American ordnance experts, but "the carriage as well as the slides" would be redesigned to work in the turret. This was not a concern for Ericsson. "You will not doubt my ability to handle the [XI-inch] gun," he assured Commodore Smith, "if you call to mind the facility with which the 12 inch guns of the *Princeton* were worked with my carriages and friction gear."[182] In fact, the weapons determined the size of the turret, and consequently the entire structure of the ship.[183] This underlying principle, fundamental in the evolution of the modern warship, marked a crucial difference from British practice. Following the Civil War, the British Ordnance Select Committee observed the U.S. Navy's "policy of considering the armament of a ship more particularly before designing her, with a view to obviate the difficulty and inconvenience frequently experienced in placing suitable guns on board a given ship, for the want of sufficient room, is a question for the consideration of the Admiralty—but it appears to the Committee to be well worthy of their attention."

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[180] 4-10-1861, Ericsson to Smith; 8-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.
[181] 18-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.
[182] 8-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.
[183] Though "the entire vessel is but a piece of mechanism, built for specific objects," Stimers enthusiastically wrote to Dahlgren, the armament would in some degree still have to be modified for the weapons platform, rather than vice-versa. Ericsson and Chief Engineer Stimers preferred the barrels of the 11-inch Dahlgrens eventually assigned to the *Monitor* to be shortened by 18 inches. Since the ironclad was intended for short-range actions added range would be a secondary concern to easier loading and greater rate of fire. 16-11-1861, Stimers to Dahlgren, DP.

Admiral Robinson, the Controller, could only "entirely concur in the remarks made both by the Ordnance Select Committee and Captain [Astley Cooper] Key on the necessity of considering the Armament of a Ship before designing her, and on the importance of considering a Ship as mainly designed to carry Guns..." But heavy guns for the Royal Navy were the responsibility of the War Office, who in turn relied largely upon private inventors; the leading British guns were still on the testing grounds and few in number. The Admiralty was increasingly frustrated; Robinson had "often pointed out the difficulties of designing a Ship without minute information as to the Armament proposed to be carried" and noted with his usual touch of complaint "that at this very moment there are more Ships fitted to carry large guns than there are guns ready to put into them."[184]

Thus on 8 October 1861, when Ericsson requested specs for the 11-inch Dahlgren, Smith was quick to inform Captain A. A. Harwood, the new Chief of the Bureau of Ordnance, that in addition to these two of the guns themselves would need to be "supplied at New York for the use of said Vessel." On the 13th Ericsson wrote Smith he could not "proceed with the work on the battery turret until the receipt of drawing of the Dahlgren gun" but by then it was already en route. Smith, in the meantime, was sure to remind Secretary Welles that the Dahlgrens "should be prepared soon, as in case they are not ready when demanded by the Contractor, advantage may be taken of that clause in the contract which provides that the test shall be made by the Department within ninety days after the time stipulated for her completion." The Navy's own Bureaus had to cooperate fully and quickly amongst themselves. Increasing tension between the private contractor and the Government/naval professionals meant increased efforts to insure such an arrangement was not "impaired in any manner on our part." This was probably more a relationship of mutual "respect" than mutual trust. "If the guns are not furnished and the vessel should

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[184] ADM 1/5941, 29-3-1865; the enclosed report of the Ordnance Select Committee is dated 27-2-1865.

prove a failure," Smith warned, "the contract may be vitiated and the Government suffer."[185]

The building of the original *Monitor* was highly indicative of how this relationship evolved in the Union Navy's ironclad program. Smith may have wanted to trust Ericsson during the early stages of the *Monitor*'s construction, but frequently did not. He did, however, make sincere efforts to understand, and was relentless in this pursuit with the irritable inventor. "I understand computations have been made by expert Naval Architects of the displacement of your vessel," Smith wrote to Ericsson on 11 October, "and...she will not float with the load you propose to put upon her and if she would she could not stand upright for want of stability, nor attain a speed of 4 knots." The Navy Chief also disapproved of the abrupt overhang where the *Monitor*'s upper raft hull was fastened to the lower hull and actually advised Ericsson to consult published British reports on Coles' shield design. Yet he was "extremely anxious about the success of this battery" for good reason: "the Govt. want some Dozen of them if they prove successful."[186] Feeling challenged, tempted, though nonetheless annoyed, Ericsson replied "to these absurd statements made in relation to the battery" with full calculations of displacement and buoyancy which Smith could examine for himself. A diagram/lecture on stability Ericsson promised to send the following day, adding "there is no living man who has tripped me in calculation or proved my figures wrong in a single instance in matters relating to theoretical computation."[187] At some point the established authorities would simply have to trust him.

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[185] 8-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49; 11-10-1861, Smith to Harwood, RG 74, Entry 16, Box 4, Letterbook, 10; 13-10-1861, Ericsson to Smith, 12-10-1861; Smith to Ericsson, RG 45, Entry 464, AD, Box 49; 19-10-1861, Smith to Welles, RG 71, Entry 1, Vol. 74, (Letterbook, 126-7.)

[186] 11-10-1861, Smith to Ericsson, EPPA.

[187] 14-10-1861, Ericsson to Smith; 16-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49. Ericsson was also worried the plans for the *Monitor* were leaked, but Smith assured him the "naval architects" in question were, in fact, those of the Bureau of Construction & Repair (namely John Lenthall), 16-10-1861, Smith to Ericsson, EPPA.

Yet "Monitor converts", or "Ericsson's disciples", would have to be made one at a time, at least at first. The repeated, somewhat derogatory usage of these terms only emphasises the fact that an entire reordering of thought was occurring; a scientific rather than religious affair. This was a naval paradigm in the making.

Neither was there, given the circumstances, any margin for failure. Smith tried to explain to Ericsson how he had "taken for granted" the latter's confident and energetic arguments, thereby assuming "a great responsibility in recommending in haste, to meet the demands of the service, your plan."[188] Not just the Navy and the Government's reputation was at stake, but his own. Scepticism prevailed. The "knowing ones" at the Ordnance Bureau, for example, doubted he would receive the highly-coveted 11-inch Dahlgrens, saying they "will never be used on her." Though slightly more at ease thanks to Ericsson's essays on displacement and stability, Smith then doubted the *Monitor*'s ventilation system. Surely, carbonic acid gas would afflict the crew, especially the firemen. The only obvious solution to him was "that a temporary house must be constructed on deck, to be knocked away by shot if it so happens, for the officers."[189] For his part Ericsson responded that "the magnitude of the work I have to do exceeds anything I have ever before undertaken because there is not sufficient time left for planning, everything must be put in hand at once, a condition truly difficult." Yet he begged Smith "to rest tranquil as to the result; success cannot fail to crown the undertaking." This was precisely because the vessel in question was more of a "machine", the product of an engineer as well as a traditional shipbuilder. "Nothing is attempted not already well tried," Ericsson wrote, "or of so strictly a mechanical a nature as to be susceptible of previous determination."[190] At the

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[188] 14-10-1861, Smith to Ericsson, EPPA.

[189] 16-10-1861, Smith to Ericsson, EPPA. Smith later explained to Chief Engineer Alban C. Stimers (recently assigned to superintend for the Navy the *Monitor*'s construction) he had "pressed the Department so urgently to have the XI inch Dahlgren guns ready that one has been taken off the Pensacola, and another, the only one at the Navy Yard... The foundries have been so engaged that new guns could not be made in time," 15-11-1861, Smith to Stimers, RG 45, Entry 464, AD, Box 51.

[190] 17-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.

height of the Industrial Age, Ericsson was banking on the idea that the *Monitor* could be designed as a matter of universal calculation rather than personal experience. An engineer, like a shipbuilder, could design an ironclad. But the more potential problems were potentially solved by mechanical means (in this instance, the "sub-aquatic" *Monitor*'s necessarily artificial system of ventilation[191]), the more important became the role of the engineer, and the more a steam-powered, iron-armoured *warship* became a *device* rather than a *tool*. Significantly, after the Battle of Hampton Roads the *National Intelligencer* wrote that Ericsson had "placed the people and the Government under incalculable obligations to his scientific attainments", the *Monitor*.[192]

There was another dimension involved. When Ericsson finally received the Department's own calculations of his battery's displacement, on 17 October, it did not take him long to report them "erroneous from beginning to end." Lenthall had calculated for fresh, not salt water, and either way the difference, according to Ericsson, was only 2-inches extra immersion—a positive advantage in combat. In fact it proved relatively easy for the ironclad-inventor to dismantle an "observer's" calculations of the weight of his ship. "There are several dimensions that have been changed in laying out the work," he noted, and "the substances particularly are varied." As an example, the "1-inch" armour plates were really " 15/16ths-inch thick". Though the difference in weight (and therefore cost) would be readily adjusted on the Government's bill, Ericsson assured Smith, it was clearly impossible to double-check vital factors like displacement since these could only be based on details missing in the original contract specifications or free from constant, practically daily, modifications.[193] The Government was thus perpetually one step behind the contractor in the design evolution of such a vessel, who could also move to counter-

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[191] See 18-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.
[192] 12-3-1862, *National Intelligencer*.
[193] "Necessarily the specification," Ericsson explained to Smith, "considering the novel character of the work, could not be accurate in matters of detail, as it is not until the actual working plan is made out that precision is attained," 23-10-1861, RG 45, Entry 464, AD, Box 49.

question professional authority. What did the Navy know about ironclads, let alone iron-hulled steamships? "A builder of iron vessels alone can correctly estimate what his vessel will weigh. In the present instance," Ericsson bluntly asserted, "the writer is the builder and knows all about the matter." Furthermore since the Navy had "thrown the entire responsibility, as to practical success, on the contractor, you will I respectfully submit permit him to exercise freely his own judgment in carrying out the mechanical part of the work."[194]

Both sides, however, recognised the value of cooperation. Neither the contractors nor the Navy could afford to alienate one another. "Captain Ericsson is at work day and night to drive the work along," Bushnell assured Smith on 21 October, "and is confident that it is impossible to improve in any particular upon his plan; but I am much pleased to have you keep him supplied with suggestions, for I know of two instances in which he has, in my judgment, greatly improved the vessel by adopting your suggestions: one by lining the inside of the turret with felt, and the other by making the bottom of [the] lower vessel wider." Though Smith wrote to Ericsson "the more I reflect upon your battery, the more fearful am I of her efficiency," he was nevertheless willing to assign Chief Engineer Alban C. Stimers to assist Ericsson as requested, and on 26 October he made the remarkable gesture of humbly apologising to the civilian he had hired. "You are the last man I desire to contest engineering questions with. I am fully aware of your scientific knowledge, skill & experience" The old Admiral was, however, understandably anxious about the Union Navy's experimental warships, upon whose success so much depended:

> I make suggestions, offer objections which are only intended for your consideration but is nowise to control your action. The responsibility rests with you and I would not change it if I could.

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[194] 18-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.

Excuse my interference thus far if I have annoyed you, & I will be silent in future.[195]

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[195] 21-10-1861, Bushnell to Smith, RG 45, Entry 464, AD, Box 49; 21-10-1861, Smith to Ericsson, RG 45, Entry 464, AD, Box 51; 26-10-1861, Smith to Ericsson, EPPA.

VII. Effect of the *Trent* Affair

It was in the midst of this complex and frenzied state of affairs in New York that news of the capture of James Mason and John Slidell from the British mail packet steamer *Trent* reached Washington. The following day, 16 November, Ericsson forwarded to Smith an account of his battery in the latest *Scientific American*, which he found "admirably clear". "In view of its bearing on the harbor defenses of the country," he noted, "I respectfully suggest to the promoters of the enterprise to present a copy to the Secretary of State." Smith was not pleased, regretting "to see a description of the vessel in print before she shall have been tested." Also wary of publicity "damaging alike to the enterprise and the navy," however, is what prompted Ericsson to supply the press with an accurate description. "We are closely watched by hundreds, and the work has now progressed so far that many imagined they saw enough to judge of the result," he explained. This was an effort on the part of the inventor to merely preserve his own reputation. The all-important sense of Northern morale, in relation to national security, was at stake.[196] Not without ominous irony, the same article leads with a description of the *Warrior*. "She has proved herself to be the fastest large war vessel afloat," as reported in the British press, "as she is no doubt the most powerful." Including the "new iron-clad gunboat" building at the Continental Works, Greenpoint, the U.S. "had no less than five iron-clad ocean war vessels in progress of construction, besides several iron-plated river steamboats on the Mississippi":

> We are therefore making considerable progress toward securing an iron-clad navy, although, with but one exception, perhaps, none of these vessels will be first-class; still they may prove very

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[196] 16-11-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49; 18-11-1861, Smith to Ericsson, RG 45, Entry 464, AD, Box 51; 20-11-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49.

> efficient, and answer all the purposes demanded by the exigencies of the times.[197]

By the end of 1861 these naval requirements of the Union were distinctly double-edged. Reflecting after the immediate crisis over the *Trent* had passed, *Blackwood's* spelled out very clearly what dangers perpetually threatened the United States during the Civil War—from the other side of the blockade; from possible offensive actions conducted by Royal Navy.[198] On 19 October 1861 *Harper's Weekly* noted sarcastically that "John Bull is a practical man" who "should scornfully trample and toss all other nations, provided always that they are weak or that calamity has befallen them..." In its issue two weeks later (whose cover also featured an artist's conception of "the Rebel Steamer '*Merrimac*', Razeed, and Iron-Clad"), Seward was depicted as ready to extract the teeth of the British Lion over the legal issue of arresting British subjects during the national crisis; his forbidding surgical instrument clutching a published letter to the Governor of New York calling for improved coastal defences.[199] Yet the crisis over the *Trent* came before the "operation", as such, even started. *Punch* recognised the Union's predicament with typically explicit relish. Its 7 December issue alone featured two cartoons; of a gentlemanly "Mr. Bull" threatening Abraham Lincoln in a buffoonish admiral's attire of "no shuffling—an ample apology—or I put the matter into the hands of my lawyers Messrs. Whitworth and Armstrong," and an oversized Jack Bull-sailor warning a diminutive Uncle Sam (dressed as a buccaneer and obviously too big for his boots) to "do what's right, my son, or I'll blow you out of the water."[200]

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[197] 16-11-1861, *Scientific American*, 313. The "five" ironclads noted, but still unnamed, were the *Monitor*, *Galena*, *New Ironsides*, the perpetually incomplete "Stevens Battery", and the recently contracted *E. A. Stevens*, or converted Coast Guard steamer *Naugatuck*. See Canney, *The Ironclads*, 73-4, on the *Naugatuck*.

[198] February 1862, *Blackwood's Edinburgh Magazine*, 228.

[199] 19-10-1861, *Harper's Weekly*, 659; and 2-11-1861, 690-1. By 21 December, *Harpers* was perhaps unconsciously pairing—in the same issue—the graphic spectre of European intervention in the form of the Allied fleet appearing over the horizon to punish Mexico (and thereby brushing aside the pretensions of the Monroe Doctrine), and Ericsson's "Battery".

[200] 7-12-1861, *Punch*, 234.

It was surprising, therefore, for the *New York Herald* to announce on the 23 November 1861, and before news of the British public reaction to the *Trent*'s seizure reached America, that "we anticipate no conflict with Great Britain, nor do we believe that any serious trouble will grow out of Messrs. Slidell and Mason's arrest."[201] Active Midshipman Oliver Ambrose Batcheller, serving aboard the U.S.S. *Vincennes* off the mouth of the Mississippi River, wrote to his mother he too could "not believe" there would be war; rumours of a British ultimatum were "nonsense". "Trust Johnny Bull for any thing but so bold a move as that! It is not his nature." Even if it was, he confidently assured his mother "that our Government will refuse to comply with the demand and that every possible means be employed to prepare for the war and when it comes fight until there are just men enough left to hang Mason and Slidell..."[202] Some members of the public felt otherwise. "I do not feel at all sure that we shall not get into a serious complication with England," a friend of Secretary Welles wrote. "England is terribly touchy about her flag, & does not feel any too good natured to us to begin with." An Anglo-American war "would be death to us just now."[203] Instead, when the Lincoln Administration decided a month later to return them back on their way to England, the *Herald* coolly pledged "...as Rome remembered Carthage form the invasion of Hannibal, and as France remembers St. Helena, so will the people of the United States remember and treasure up for the future this little affair of the *Trent*."[204] Midshipman Batcheller was even more bitter, noting that "A foreign war just at this time is much to be dreaded," but nevertheless calling for a "war to the last breath but never dishonor."[205]

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[201] 23-11-1862, *New York Herald.*
[202] 1-1-1862, Oliver Batcheller to his mother, BL.
[203] 25-11-1861, John Hooker to Welles, WP. George Barnard to Welles wrote that "the tone of feeling among capitalists & merchants" in Boston was to refuse any unconditional demand for surrendering the captives. Instead the Administration should offer to submit the matter to "an impartial & neutrally chosen umpire". If the British government rejected this national, world, and even a large portion of British public opinion would therefore be united against it. "The interests involved are too large & important to allow either nation to go into a war unless it can be shown to be an inevitable necessity," 16-12-1861, Barnard to Welles, WP. The same proposal and sentiment, from Buffalo, New York, can be found in 16-12-1861, Millard Fillmore to Lincoln, LP
[204] 21-12-1861, *New York Herald.*
[205] 17-1-1862, Batcheller to his mother, BL.

Be that as it may, the Union remained acutely vulnerable to British seapower in the meantime. This fact made embarrassingly obvious was the price for "depriving the rebels of much strength which they would certainly have acquired in case of a war with England and France..."[206] Here *Scientific American* anticipated a vast, mutually-destructive commerce war carried out mostly by private "swarms of rovers". Of the 15 millions tons of total world shipping, five belonged to Britain and five to the U.S. An Anglo-American holocaust would leave both nations degraded from their proud preeminance and France..."[207] A direct comparison between navies at the beginning of 1862 was overwhelmingly in favour of Great Britain. This left the Royal Navy largely free to act against Northern port-cities, either by blockade or direct assault. The United States Navy could not possibly attempt a similar offensive against the British Isles; could it even mount an effective defence? Though it mentioned Congress passing a new bill for 20 more ironclad gunboats, *Scientific American* suggestively recounted losses inflicted against English convoys during the War for Independence, and the famed exploits of American naval commanders in the War of 1812, instead. The defence of New York harbour was therefore left to the forts guarding its entrance. "But the introduction of iron-plated ships exposes us to attacks for which these forts were not provided," explained *Scientific American*. Only with the immediate mass-production of U.S. Army Captain Thomas J. Rodman's 15-inch guns could the prized-city hope to "bid defiance to the iron-clad navies of the world." Nothing else was mentioned, or in sight.[208] The cold months between November 1861 and March 1862 were thus the darkest of the Union Navy, and possibly the Union itself, throughout the American Civil War.

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[206] 29-12-1861, *New York Herald*.

[207] 28-12-1861, *Scientific American*, 407. Some U.S. naval officers were sceptical of this. In the event of an Anglo-American maritime war, "I see we could do nothing," Captain Percival Drayton wrote to Dahlgren. "Steam places [Britain's] navy in a position of superiority that she never has occupied, and has killed Privateering dead dead [sic], first because the privateers could not get coal, and next they could never get a prize in when taken. With our imperfect blockade the Sumpter [sic] has not succeeded in doing so," 10-1-1862, Drayton to Dahlgren, DP

[208] 28-12-1861, *Scientific American*, 407; also 11-1-1862, 18-1-1862 and 25-1-1862.

Against this backdrop work on the *Monitor* continued at a fever pitch. "I wish we had your vessel now," Smith wrote to Ericsson, three days after the U.S.S. *San Jacinto* removed Mason and Slidell from the *Trent*. "The Govt. must create a fleet of plated Gun Boats. They will cost much less & will be more effective than the Army." Lincoln knew that with McClellan still sitting with his newly reformed Army of the Potomac, the conspicuous absence of Northern military victories, or even offensive operations against the South, further tempted European powers to intervene in what they would regard as a hopeless and unnecessary struggle damaging to all. This only transferred pressure for success to the Union Navy. On 17 November an expedition under Commodore Samuel F. Du Pont succeeded in overwhelming the fortifications defending Port Royal. Now the controversial blockade of the southern Atlantic ports would be strengthened with a valuable Union base halfway between Savannah and Charleston. The presence of an entire flotilla light-draught ironclad batteries might therefore lead to even more ambitious projects against the Confederacy, while at the same time acting in the capacity of harbour and coast defence. Smith tantalized Ericsson. "Already I think the Department contemplates augmenting this description of force," he indicated, though the decision would not be in his hands. Furthermore, "all the mistakes we may make I suppose may turn to the advantage of others."[209] Smith had doubts about the *Galena* as well. To Bushnell he expressed his "fear that in your eagerness to build an armored vessel, you did not reflect sufficiently on the many obstacles to be encountered, and which we now have to overcome as best we can."[210]

Nevertheless, in combination with the initially-well-received news of Mason and Slidell's capture, Welles could write to his son that "this last week has been a pretty eventful one

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[209] 11-11-1861, Smith to Ericsson, EPLOC.
[210] 7-11-1861, Smith to Bushnell, RG 45, Entry 464, AD, Box 51.

PAT ON THE MASON AND SLIDELL AFFAIR.

Pat. "Whist, Jonathan, will ye Plaze to jist go on *Crushin' the Rebellion*, an' lave the Starvin' Ould Curmudgeon to Me?

AN ADVOCATE OF MORAL FORCE.

British Lion (*solus*) "This hain't the hattitude we used to take—hem! but 'Circumstances halter Cases.' Those Hiron Vessels of the Yankees—hem!—yes! We must try the '*Peacable Remonstrance*' Dodge."

(Top)

Harper's Weekly
11-1-1862

(Left)

Harper's Weekly,
31-5-1862

for the Navy Department, or rather the news of great events have been highly interesting."[211] Twelve years later, the former Secretary wrote that the capture of Port Royal was in fact "eclipsed by the startling news that the two rebel leaders, who had recently abandoned their seats in the Senate, and been selected by the Confederate organization to represent it abroad, and enlist foreign governments in its behalf, had been intercepted and were prisoners." While this was initially accepted as a victory for the Union cause, since the Confederate mission to secure national recognition and material assistance was dramatically blocked before it began, Lincoln, Welles recalled, quickly realised the prisoners "would be elephants on our hands, that we could not easily dispose of." Patriotic citizens might wrathfully demand their formal execution for treason. What message would this send to the people of the South? Lincoln's grand hopes for national reunification might be shattered.[212] A more immediate and palpable danger, however, came from an enraged British government and public. This served to sharply re-focus the North's attention back to its own weaknesses, nevermind its need for ironclad gunboats to spearhead further naval attacks against the Confederate States. As Captain John Rodgers wrote to his wife Anne, from the Union flagship at Port Royal, "we are unready and overmatched with the South, England, France and Canada—all at once." It seemed the U.S. would have to fight or acknowledge the Confederacy. "The blockade I apprehend must be stopped whether we fight or apologize—certainly if we fight."[213] It was a cruel reminder of the international strategic disposition of the United States at the end of 1861. As Welles later recounted, "our country was then crippled, and Palmerston and Russell

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[211] 17-11-1861, Welles to son (possibly Tom), WP.

[212] Gideon Welles, "The Capture and Release of Mason and Slidell", *The Galaxy*, Vol. 7 (May, 1873). "What a howl there will be among the rebel press of the South, on account of the settlement of the *Trent* affair," noted the Terre-Haute *Daily Express* of 31-12-1861. "A war between England and the United States would have been a grand diversion in their favor, but now that hope being blasted, they are left to the last, lingering, feeble one, that the South may be able to become a province of England," (from LP).

[213] 21-12-1861, John to Anne Rodgers, RFP.

well knew it. The Administration felt that we were in no condition to embark in a foreign war, whatever might be the justification of our cause."[214]

The exact purpose of the twenty new ironclad gunboats was, however, still a matter of debate in Congress. Could private contractors be relied upon to produce them in time, and without extravagant price? How would the inability of either the Navy Yards or commercial firms to produce the necessary quantity of iron armour plates complicate these concerns? What ironclad designs were best for the Union? Arch-Democrat Clement L. Vallandigham of Ohio stressed the ironclads "should be constructed as soon as possible" since "they will be needed in case of the occurrence with a foreign Power of the war which seems impending over us..." The House Chairman of Naval Affairs, Charles B. Sedgwick, disagreed—or at least misunderstood the implication. The vessels in question were "not required for any such purpose" and in fact "it did not enter into the design of the Department in recommending them. They are required at home, for use here..."[215] Two days previous he described them as "intended to be of such draught and built in such a way that they will be able to enter any harbor in the United States where there is over twelve feet of water upon the bar...to be so protected as to be able, without injury, to run past any forts or defenses of any such harbors..."[216] Undoubtedly these were the "Bureau" turret ships designed by Lenthall and Isherwood, discussed by J. P. Baxter.[217] Any interference in the contracting of these Departmental designs, Sedgwick, argued, "utterly embarrassed [the Department's] plan of overthrowing this rebellion and seizing the cities in the southern States by means of these armed vessels." But the Department's design had inherent drawbacks. Although Navy Yards and existing private contractors might be relied upon to produce engines, boilers and hulls, the armour plates

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[214] Welles, "Capture", 648.
[215] 19-12-1861, *CG*, 147.
[216] 17-12-1861, *CG*, 123.
[217] Baxter, *Introduction*, 250-2; 263-4; 275-6.

themselves were to be in solid 4½-inch thicknesses, "very large, of the best quality hammered iron, and so bent as to fit the model of a vessel." Since such plates could not be currently be manufactured in America extensively or quickly, they would have to be procured in England or France.[218] All this was fraught with added expense, delay, and political complications—especially at the height of the serious crisis over the *Trent*.

Charles W. Whitney was also trying to persuade Commodore Smith that the company he represented, H. Abbott & Son of Baltimore, was indeed capable of rolling 4½-inch plates. Hammered, or "forged", plates were proven by recent English experiments "to be brittle, unreliable, and incapable of resisting heavy shot..." With "our American charcoal iron" Abbott could insure superiority over any plates contracted for abroad. Three of their mills were already "in full operation day and night" with a fourth mill, even larger, under construction for the past six months. Within a month this last "could commence rolling the 4½ inch plates at once." The 1-inch plates for Ericsson's battery were already being supplied by them. Yet Smith noted that "Mr. Ericsson...endeavored to get Plates (4 inch thickness) from Mr. Abbott of Baltimore, for his battery, but in vain." He believed "the Navy Department is now about to build some iron-clad vessels, to be plated of 4½ inch iron"; perhaps now Abbott's offers could be taken more seriously than in early October, but Smith had "no control and no knowledge" of the Construction Bureau's plan for ironclads.[219] Insistence by the Department upon hammered plates might save time and avoid complication than formally encouraging private firms to invest in new rolling

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[218] 19-12-1861, *CG*, 148. Bending thicker armour plates was itself problematic. Heating them for the purpose was a more labour intensive, time-consuming and expensive process, while 'cold-bending' them with special heavy presses, according to tests conducted by the Iron Plate Committee, tended to damage the weld of the plates themselves and weaken their resisting powers. On 21 January 1862 Samuel Pook wrote to Commodore Smith that the armouring of the *Galena* was "now going on more rapidly than it has at any time before...principally because the bars are now all bent and twisted by a wooden lever, instead of being heated and bent, as was first deemed necessary," RG 45, Entry 464, AD, Box 51. The *Monitor*'s 1-inch laminated iron plates could also be cold-bent and their more concentrated welds were perhaps individually less subject to strain.

[219] 10-12-1861, Whitney to Smith; 11-12-1861, Smith to Whitney, RG 45, Entry 464, AD, Box 51.

machines, planers, cranes, etc.[220] The *New Ironsides* was already committed to hammered armour plates of 4½-inch thickness. Twenty turret-ironclads, however, would require more of such forged iron than time permitted, let alone a large-scale industrial upgrade for rolling even thicker armour than Ericsson's battery.

The *Trent* Affair also had the effect of redoubling Washington's efforts to improve the North's coastal fortifications.[221] On 14 October 1861 Seward had addressed the Governors "of all the Sates on the seaboard and lakes". Even though the likelihood of European intervention was "less serious than it has been at any previous period during the course of the insurrection," Southern agents were working hard to capitalise on "the embarrassments of agriculture, manufactures, and commerce in foreign countries" as a result of the blockade. A controversy might suddenly add "the evils of a foreign war...upon those of civil commotion which we are endeavoring to cure." By neglecting the defence of its ports and harbours, the Union would "voluntarily incur danger in tempestuous seasons when it fails to show that it has sheltered itself on every side from which the storm might possibly come." Preoccupied with the immediate needs of the Army and Navy, the Federal Government needed the States to assess their own defences and submit the matter to Congress when it next convened.

The Governor of Maine responded that his state was particularly subject to attack, as it was in the War of 1812. Portland's strategic importance was immense. "Its geographical position commands Canada on the north, and the lower provinces on the east, if properly fortified, as lines of railway, completed or in process of construction, radiate from it to Quebec and Montreal, and to St. John and Halifax." If occupied by Great Britain,

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[220] At any rate, Smith found recent shavings from the 4½-inch (hammered) plates "made from scraps", being made for the *New Ironsides*, indicated "great toughness and tenacity", 5-12-1861, Smith to Whitney, RG 45, Entry 464, AD, Box 51.

[221] See for example 9-12-1861, Joseph G. Totten (U.S. Army Brevet Brigadier General and Colonel of Engineers) to Simon Cameron (Secretary of War), in Executive Document No. 6, House of Representatives, 37th Congress, 2nd Session, *Estimates for Fortifications*, 1-5.

American commerce on the Great Lakes and the ocean would be driven away; if properly fortified, it could serve as a main base of operations by the U.S. Navy. Lincoln and the War Department agreed. Officers would be sent to make official estimates, but Maine would have to pay the bill "in the first instance, advanced to the general government in the nature of a loan for the general defence of the country at large" which there was "every reason to believe" Congress would approve. This would be paid back "within a reasonable period", later specified on December 17, in the form of U.S. bonds "twenty years after date, bearing six per cent. interest, payable semi-annually".[222] Since it was by no means clear whether the Union would actually survive the Civil War, the government's warning of possible hostilities with foreign powers, and the willingness of Northern states to risk the expense of greater defences, was both realistic and brave. Preserving the sovereignty of the United States required an enormous act of faith.

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[222] 19-12-1861, Executive Document No. 14, House of Representatives, 37th Congress, 2nd Session, *Fortification of the Sea-Coast and Lakes—Message from the President of the United States*, 1-8.

VIII. Congress debates the "20 ironclad gunboats"

On 8 January 1862 the U.S. Senate debated whether or not to amend House Bill No. 153, which authorised Gideon Welles to construct "twenty iron-clad steam gunboats". The proposal would replace the words "Secretary of the Navy" with "the President" and would make the Chief Executive directly responsible for the contracting—and therefore also the designs, success or failure—of the Union's new ironclads. Welles was at the time under suspicion for some of the New York-based contracting of the early converted merchant ships purchased for the service on the blockade.[223] Much of this stemmed from disaffected contractors wielding powerful newspaper connections in revenge; rumour and innuendo. But worse than the implication that the Secretary was incompetent or corrupt (perhaps even "treasonous") was the attempt to spotlight Lincoln if he retained Welles in his cabinet.[224] The failure of a single ironclad in the midst of the Civil War might conceivably sink the entire Administration not just one of its departments, or one of their bureaus.

On the same day, ironically enough, John Griswold wrote to Ericsson that their business partner John F. Winslow had returned from Washington, after a "thorough & very satisfactory interview with Secretaries Welles & Seward; also with the Pres. & Asst. Fox." The issue, of course, was which pattern the new fleet of armoured gunboats would take. John Lenthall and Benjamin Isherwood, the Chiefs of the Bureaus of Construction and Steam Repair, respectively, enjoyed the obvious 'inside track' with their scheme for Coles-type turret ironclads. But inasmuch as the Navy professionals asserted their own design would best match the complex strategic needs of the country, the New York contractors already had a rival prototype nearing completion. Ericsson's *Monitor* had

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[223] See Baxter, *Introduction*, 279-80.
[224] 8-1-1862, *CG*, 219-21.

finally managed to gain the respect of Commodore Smith, another Bureau Chief, and was fast becoming a technological icon for young, ambitious engineers like Alban Stimers.[225] "We can have things our own way," Griswold related to Ericsson, but only "if the Battery proves Equal to our expectation". The Government, while in a desperate hurry to obtain ironclads, was nonetheless willing to wait; "nothing, to any extent, will be contracted for till she has been tested."[226]

Time worked in more ways than one. Alarming reports were reaching the North of the steady progress of the rebel conversion of the *Merrimack* at Norfolk. Such an ironclad in the hands of former U.S. naval officer Franklin Buchanan (recent commandant of the Washington Navy Yard and first superintendent of the U.S. Naval Academy in 1845) would surely be used for more than just the protection of Norfolk or the James River leading to the Confederate capitol of Richmond. The entire control of Hampton Roads, the anchor of the Union blockade itself, would be challenged. Wooden steamships would face an armoured one. Fortress Monroe might even be compelled to surrender—a loss more devastating than Fort Sumter nearly a year earlier, since the backdoor to Washington would be exposed to Confederate naval power. The offensive aims of the Union Army were also converging on this vital strategic crossroads, North and South. Although 'his' Grand Army of the Potomac was now properly trained and equipped since the disaster of Bull Run, General George B. McClellan was not eager to risk its destruction in another frontal assault against the reinforced Confederate Army blocking the same route to Richmond. Instead he contemplated a massive flanking thrust towards Richmond via the York and James Peninsula, utilising—and thus dependent upon—Union naval power. It became increasingly likely, therefore, that a showdown would take place between the *Merrimack* and the only Union ironclad possibly ready in time,

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[225] Frank M. Bennett, *The Steam Navy of the United States* (Westport: Greenwood Press, reprint of 1896), 280-1, 337-8.
[226] 8-1-1862, Griswold to Ericsson, EPPA.

the *Monitor.* This would be the latter vessel's contractual "test of fire".[227] Hence Ericsson and his associates held another distinct advantage. As Griswold pointed out, "they were amazed at Washington to learn that within the hundred days the Battery would be completed..." Under these circumstances, "they [Lenthall and Isherwood] dare not override us, & the 'arrangement' so nicely made is knocked into the future, if not killed."[228]

According to Baxter, the status of the Bureau's ironclad proposal was by then already uncertain. This was because one man in particular, Gustavus Fox, the Assistant Secretary of the Navy, was by now uncertain about the effectiveness of the Bureau's design against Ericsson's. It was his insistence for the Bureau to press ahead with, and the design was as much his own as it was Lenthall and Isherwood's.[229] But when Ericsson and his associates learned of this ambitious move on the part of the Navy, they moved quickly to question the expediency of Fox's design, if not also implicitly the purpose for which these ironclads were intended. On 23 December Ericsson wrote to Welles offering to build six more ironclads, noting that Coles' turrets were ill-designed, unable to withstand the shock of impact from heavy shot because of their reliance on short segments of wood-backing, and cogs for rotation near the vulnerable inside base of the turret.[230]

At any rate, these technical objections coincided with Welles' own aversion to procuring ironclads or armour plates abroad—in fact, to rely upon foreign powers at all during the Civil War, and especially in the malodorous climate before, during, and especially as a

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[227] "I think the wrought iron shot of the Ericsson Battery will smash in her [the *Merrimack*'s] 2¼ inch plates," Smith wrote Ericsson, "provided she can get near enough to hers, whilst the IX inch Shot and shells of the Merrimac will not upset your Turret. Let us have the test as soon as possible, for that ship [the *Merrimack*] will be a troublesome customer to our vessels in Hampton Roads," 29-1-1862, Smith to Ericsson, EPPA.

[228] 8-1-1862, Griswold to Ericsson, EPPA.

[229] For a more complete look at Fox's career as Assistant Secretary see William J. Sullivan, "Gustavus Vasa Fox and Naval Administration", Catholic University of America, unpublished Ph.D. thesis, 1977.

[230] See Baxter, *Introduction*, appendices, 350-60.

Gustavus Vasa Fox, Assistant Secretary of the Navy

(Naval Historical Center website)

Chief Engineer Alban C. Stimers

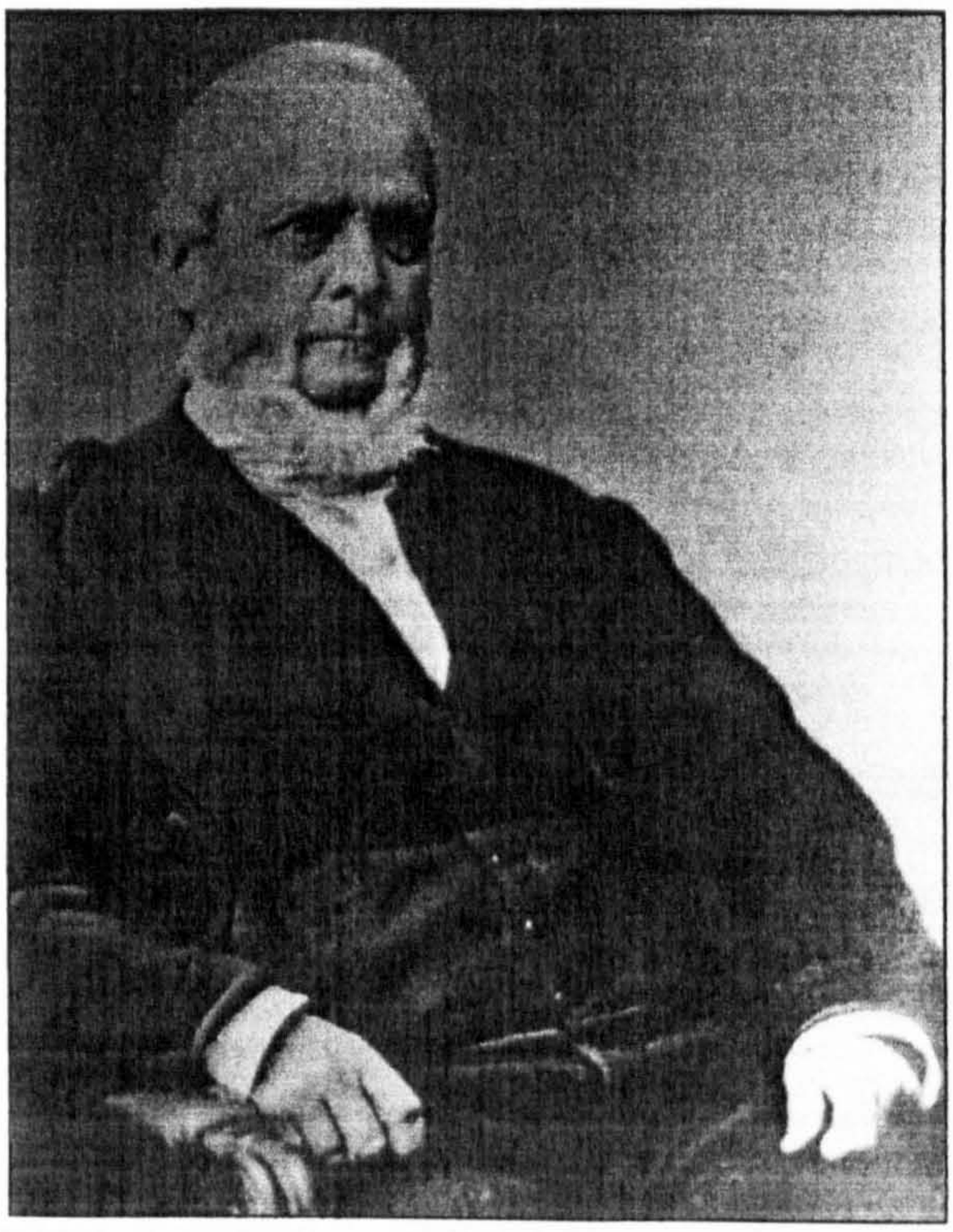
(Naval Historical Center website)

Benjamin F. Isherwood, Chief of the Bureau of Steam Engineering

(from Jerry Harlowe, *Monitors: the Men, Machines and Mystique*)

John Ericsson

(Naval Historical Center website)



John Lenthall, Chief of the Bureau of Ships Construction and Repair

(from Edward William Sloan III, *Benjamin Franklin Isherwood*)

result of, the *Trent* crisis. On 31 January prominent engineer Daniel B. Martin reported to Lenthall from Liverpool. After visiting all the major armour plate manufactures and iron shipbuilders of the United Kingdom, and "invited bids for the Armour and Towers [of the Bureau's proposed turret-ship] to be sent to me at this place by the 20th inst.", he had still not received "one direct offer". Violating British neutrality was a concern. Northern financial credit was also as suspect as that of the South. "None of the parties would be willing to make a Contract until advices was received about the payments." Finally, "all of the parties capable of doing this kind of work are full of orders, there is I understand orders for Armor plates from the French, Spanish, Russian, Austrian, and Italian Governments, beside what is being done for this Government which appears to be doing considerable in that line." At any rate, the actual bending of plates, Martin noted, "has been done by the Ship Builders", not the manufacturers.[231] The seed of doubt was thus effectively planted. A hasty commitment to one entire class of ironclads might prove disastrous—and Congress was already indicating just how high that repercussion might reach.

These factors only combined to add more pressure for the original battery to "penetrate Southern barriers", "withstand shore batteries fire", and check the *Merrimack*. On 14 January Smith crisply notified Ericsson that 'the time for the completion of the shot-proof battery according to the stipulations of your contract, expired on the 12th instant." Ten days previously Ericsson grumbled that although $200,000 of private funds had already been expended in construction of the vessel, "only $37,500 have as yet been paid by the navy agent, and that amount was not obtained until five weeks after the presentation of your order." Because of this, his "contemplated organization and operation by what is called night gangs, has been to some extent frustrated." Stimers also retorted, on 21 January, that the two 11-inch Dahlgrens now needed for the 'Ericsson Battery' were

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[231] 31-1-1862, Daniel B. Martin to Smith, RG 19, Entry 61, Box 1.

nowhere to be seen. "I believe, however," he wrote to Smith, "that there are now two of these guns afloat in the gunboats at the navy yard, and it therefore resolves itself into a choice between whether the Ericsson Battery or two wooden gunboats should be delayed." One can imagine the Commodore's anger upon receiving this news. It was exactly the sort of bureaucratic obfuscation he had feared since October might humiliate the Department in its dealings with private contractors, while depriving the Government of its right to enforce deadlines. Few professionals within the Department seemed to take the experimental ironclad seriously. "I took pains to have two XI-inch guns ready for the Erricsson [sic]," Smith complained to Secretary Welles, "but it seems they have been taken for other vessels."[232] At least the *Monitor*'s newly appointed commanding officer, Lieutenant John L. Worden, "after a hasty examination of her," was "induced to believe that she may prove a success."[233] By the 24th Stimers estimated a revised launching date for the *Monitor* in five days, "if the tide does not serve badly on that day." Along with the missing Dahlgrens, the last armour plates ordered for this completely 'pre-fabricated' iron warship were behind delivery.[234] As Stimers poignantly observed, "the more nearly completed each part becomes, the more practicable it looks."[235] Ericsson's long-held, radical vision was becoming a clear-cut reality. But would it successfully conform to the multiple (and often contradictory) requirements of the Union Navy?

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[232] 14-1-1862, Smith to Ericsson, RG 45, Entry 464, AD, Box 51; 4-10-1861, Ericsson to Smith, RG 45, Entry 464, AD, Box 49; 21-1-1862, Stimers to Smith, with Smith's endorsement included, RG 45, Entry 464, AD, Box 51.

[233] 13-1-1862, Worden to Smith, *ORN*, Series 1, Vol. 6, 516-17.

[234] See William N. Still, Jr., Monitor *Builders: A Historical Study of the Principal Firms and Individuals Involved in the Construction of USS* Monitor (Washington, D.C.: Department of the Interior, 1988), especially 24-6.

[235] 24-1-1862, Stimers to Smith, RG 45, Entry 464, AD, Box 51. The *Monitor* was launched on the morning of 30 January, 1862.

Thus, the following day Hale was obliged to ask the Navy Department what exactly its plans for an ironclad flotilla were; purpose and form.[236] Welles' reply of 7 February 1862, was, at this juncture, absolutely crucial. The Department could "probably build ten or twelve iron-clad gunboats in the next six months," he wrote, "and probably double or three times that number within a year." As for any specific model, Welles relayed that his Department did not "propose to confine itself exclusively to any particular plan yet offered", but would indeed "avail itself of the experience which will be gained in the construction of those now going forward, one of which will soon be tested in actual conflict." This was clearly the *Monitor*. Ericsson's proposal, to dispel any doubts, was mentioned by name; and the "ten or twelve gun-boats" are in fact his own. The Bureau turret ship scheme had already lost its inside advantage. This was due more to its own inherent design drawbacks, rather than the "political" influence of Ericsson and his financial backers, as others have suggested.[237] Facts spoke louder than words at the time; if the Bureau turret ships could have been produced as cheaply, easily and quickly as Ericsson's monitor-ironclads they might have stood a better chance with primary decision-makers involved, namely Fox and Welles, and probably to some extent, Abraham Lincoln himself. The actual tactical superiority of the monitor design over the Fox-Lenthall scheme was another matter. Issues of laminated armour vs. solid plate (and rolled iron over hammered), Coles "cupolas" or Ericsson "towers", two turrets with one gun or one turret with two, and low freeboard vs. freeboard even lower were all largely conjectural. Arguably, they remain so today. But laminated 1-inch plating, bent into turrets, could be had; rolled 4½-inch plates could not. A working model of an Ericsson turret vessel at least now existed for testing and improvement; Coles' prototype was still

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[236] Reprinted, with Welles' reply in 8-2-1862, *CG*, 697.

[237] See for example, William H. Roberts, " 'The Name of Ericsson': Political Engineering in the Union Ironclad Program, 1861-1863", *Journal of Military History*, Vol. 63, No. 4 (1999), reflecting the bitter contemporary suspicions of Captain Thomas Turner of the U.S.S. *New Ironsides*; see 7-5-1863, Turner to John Andrew (Governor Massachusetts), Hamilton Fish Papers, Library of Congress, Manuscript Division, Washington, D.C.

years away from completion. Ericsson's arguments for maximum concentration of weight, armour protection and firepower *were* better realized in the single turret of even thicker armour protection and ever greater guns than multiple turrets weakly protecting weaker armaments by comparison. Higher freeboard, at the same time, meant more area to be plated—or less area protected at all. Given the fact that the Bureau turret ships were not intended for cruising purposes, any arguments for partial protection lost their meaning, while a monitor's freeboard capitalised on even greater economy of national resources needed for its construction *and* consolidation of defensive force.

There are at least two important features of Welles' response to the Hale; the Navy's response to the Senate; the Administration's response to Congress. First, the *Monitor* had all but established itself as the prototype coastal defence ironclad of the Civil War at least a month *before* the Battle of Hampton Roads, not as a result of its famous duel with the C.S.S. *Virginia*. Recurring arguments that "Monitor Mania" as a result of the events of 8-9 March 1862 somehow "blinded" Assistant Secretary Fox and the Navy Department as a whole neglect this fact. To be sure, the enormous and unprecedented national excitement and enthusiasm for Ericsson's strikingly futuristic warships did wonders for the Navy's public relations, and gave the White House an ever-welcome boost of support. If the Navy had half-committed itself to monitors before Hampton Roads—(for that matter, was there really another 'half'?)—it was certainly bound to them afterwards. But any efforts made by the "powerful Ericsson Lobby" or "clique" were far from conspiratorial in nature. They were wide open to professional scrutiny.[238] Indeed, it was

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[238] Still notes that "Charles H. Cramp, who owned extensive shipbuilding facilities in Philadelphia, wrote in his memoirs of a New York 'ring' presumably involving Admiral Gregory and other naval officers responsible for warship construction in the country, as well as influential civilians. He accused the 'ring' of preventing 'the construction of a type of iron clad vessel except monitors,' and of concentrating warship construction, especially armored vessels, in New York City." Yet most pre-war iron shipbuilding, Still continues, was concentrated in New York City. Ericsson's backers, especially John Griswold, did have political influence; "Nevertheless, there is no evidence that a New York ring existed. Of the 27 monitors contracted before 1863, 20 were built outside New York City, and naval officers in Washington,

Ericsson's near-invincibility on technical issues which all but guaranteed him advantage over many rival designs for ironclads submitted to the Navy throughout the American Civil War. As Hale later commented to Congress, "these boats are considered by the Department, and by practical men who have the best means of judging, as the very best, and in fact the only means of coast defense that is now known to the military science."[239]

Secondly, to Hale's inquiry of the *purpose* of the (monitor) ironclad gunboats proposed by the Navy, Welles stated they were "to reduce all the fortified sea ports of the enemy and open their harbors to the Union Army." Examined closely, this was a significant caveat not mentioned by Ericsson. Even the 1856 proposal to Napoleon III was intended to attack ships, not forts. His private letter to Lincoln of August 1861 maintained this distinction, adding only that his floating batteries would help protect Northern ports from attack by European ironclads. Even in naming the *Monitor*, Ericsson specified:

> The impregnable and aggressive character of this structure will admonish the leaders of the Southern Rebellion that the batteries on the banks of their rivers will no longer present *barriers to the entrance* of the Union forces.
>
> The iron-clad intruder will thus prove a severe monitor to those leaders.
>
> But there are other leaders who will also be startled and admonished by the booming of the guns from the impregnable iron turret: "Downing Street" will hardly view with indifference this last "Yankee notion," this monitor. To the Lords of the Admiralty the new craft will be a monitor, suggesting doubts as to the propriety of completing those four steel ships at three and a half million apiece.
>
> On these and many similar grounds, I propose to name the new battery *Monitor.*[240]

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particularly...Fox, were most responsible for concentrating on the monitor type," Still, Monitor *Builders*, 29.

[239] 8-2-1862, *CG*, 697.

[240] 20-1-1862, Ericsson to Fox, quoted from Ericsson, *Contributions*, 465-6 *emphasis mine*. This letter still ruffles British feathers today; the 1976 *Oxford Companion to Ships and the Sea* declaring that "Downing Street, in fact, viewed the *Monitor* with complete indifference, having two years earlier launched the

Yet when Hale recommended Ericsson's "boats" to Congress, he too added that "stone forts can be battered down by these batteries."[241]

In fact, Welles' reply bears the hallmark influence of Fox, whose own thinking retained the original concept that the gunboats were to run Confederate gauntlets and engage Confederate forts, not Grimes's assertion they were to solve the nation's coastal defence problems in the face of foreign—particularly British—naval intervention.[242] This contradiction between coastal assault and coastal defence, between attacking the Confederacy and defending against the British Empire would manifest itself more clearly as soon as the *Passaic*-class monitors saw action, a year later. Furthermore, their obvious failure to reduce forts—at least without direct support from the Army—would outweigh their intrinsically less-obvious success in deterring foreign intervention. It would be much easier for political opponents of the Lincoln Administration to point to blatant battlefield defeats, or at least "repulses", than subtle diplomatic victories. The ironclads might topple the Executive after all.

At any rate, the Union's naval resources were perpetually split between the need to maintain its command of the sea, or at least the protection of its commerce worldwide, and strike at the Confederacy. On the eve of the Battle of Hampton Roads, Fox apologized to Flag-Officer Louis M. Goldsborough, commanding the North Atlantic Blockading Squadron, for the short supply of the new double-ender gunboats. "I presume you are aware that we are about to undertake the biggest job of the war," he wrote, referring to the forthcoming operation against New Orleans, "and that we are straining every nerve to concentrate a force to accomplish it successfully; this is why we

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Warrior, which could have blown fifty *Monitors* out of the water," Peter Kemp (ed.), *The Oxford Companion to Ships and the Sea* (New York: Oxford University Press, 1976), 555.

[241] 8-2-1862, *CG*, 697.

[242] See for example, 4-2-1862, *CG*, 620-1.

have no boats." Meanwhile, the Confederate commerce raiders *Nashville* and *Sumter* were having their own way against Northern shipping, "when we ought to have a dozen boats after them." Nevertheless, the Navy was "immensely popular and will remain so if we continue successful," Fox concluded.[243] In addition to victories off the North Carolina coast, Forts Henry and Donelson had fallen in the West, thanks to the combined operations of Union land forces under General Ulysses S. Grant and Commodore Foote's partially armoured steam-gunboats.

Yet victories at home served two types of political purposes. In debating the Naval Appropriations Bill, on 12 February, including the supplementary appropriation of $15 million for an improved class of double-ender gunboats, Navy supporters could easily point to their own usefulness in suppressing the rebellion. Sedgwick recapitulated "Mr. Speaker, Congress has appropriated money for the Navy with great liberality. It has hitherto ordered to be built twenty-three gunboats, twelve side-wheel vessels, and three ironclad vessels." But "the Navy has got something to show for the money expended on it. It has got Hatteras, and Port Royal, and Roanoke Island, and it will have taken every fortified place on the rebel coast within the next four months if liberal appropriations are continued to be made for it." Yet, "on the other side of the Atlantic to-day, nothing can be pointed to as having been achieved by the Army that looks to the suppression of the rebellion," remarked one congressman. "The governing classes of England, with Palmerston at their head," were "willing if not anxious to go to war..." Subsequently, "the one power which we can create to resist them, is just the power to the creation of which these $15,000,000 are to be set apart; and I am, therefore, large as the sum is, in favor of putting it at the disposal of the Secretary of the Navy for this purpose.[244]

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[243] 1-3-1862, Fox to Goldsborough, *ORN*, Series 1, Vol. 6, 624.
[244] *Ibid.*

A disaster at New Orleans, on the other hand, Fox wrote to Commander David D. Porter, would be "fatal to everything and overwhelms the Navy and everybody connected with it in everlasting disgrace." Taunting foreign as well as domestic eyes were watching too. "The French and Russian both said to me today 'recollect that you are to have New Orleans on the 10th of March', but we will give you till the 20th."[245] All this said nothing for any Confederate naval initiative, however. On 21 February Captain John Marston of the steam frigate *Roanoke*—lying at Hampton Roads with her engine disabled and a crew short of 180 men—related to Welles the disturbing local intelligence that "the *Merrimack* will positively attack Newport News within five days..."[246]

Summary:

The Trent *Affair suddenly upset the Union's offensive strategic initiative against the Confederacy, forcing a defensive one instead against Great Britain. This led to a subsequent confusion as to what type of ironclads should be built, and what their ultimate purpose would be, offensive or defensive. Such a tactical-level dichotomy reflected the larger strategic debate over how the Union would successfully crush the Rebellion. It could not obviously win the war on the defensive, and in the absence of aggressive action on the part of the Army of the Potomac under General McClellan, relatively quick strikes by the Navy, feasibly taking out one Southern port city after another, seemed a logical alternative. Nevertheless, the war could not be won either if it involved foreign powers operating against one Northern port city after another. In this sense it was always held to be more important to secure the Union against possible interference first and last, before any efforts to subdue the domestic enemy could be reasonably expected to succeed. Great Britain was the bigger* potential *threat to the survival of the United States, even if—and especially if—it was already at war with the Confederate States.*

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[245] 24-2-1862, Fox to Porter, PFP.
[246] 21-2-1862, Marston to Welles, RG 45, Entry 15.

This was not a universal opinion, however. In the final Senate debate of 12 February 1862, over House Bill No. 165—for coastal fortifications—Senator Hale objected it had "nothing to do with the present war. It is prospective. It looks to other things than the prosecution of this war or the defense of the country in it; and it appropriates $7,000,000, when we need every dollar we can beg and borrow, and I had almost said steal, but the stealing is the other way." A string of fortifications along the northern frontier, he added, would provoke a similar British response and a spiralling arms race. Nevertheless, the bill passed the Senate with a vote of 28 to 10.[247] *It was better to be safe than sorry, and by 1862 the U.S. Navy, the Lincoln Administration and the Northern public alike found themselves thoroughly humiliated by the very real and likely threat of British intervention—British seapower—and were determined this type of political influence could never again be wielded against the Union.*

The shift towards a Brown-Water naval force even before the issue arose of ironclad "boats" or "batteries" also reflected the overriding strategic requirements of the United States in comparison with those of the British Empire at the same time. Dahlgren had meanwhile expressed a willingness to forego a measure of strategic range, if not seakeeping, in favour of a tactically superior, mastless ironclad entirely reliant upon her supply of coal to determine the extent of her operations. The foreign threat only added to this concern for regional, if not coastal, supremacy—even as the Admiralty committed itself to a program of deep-draft, iron-hulled ironclads mounting the largest array of mast, sails and rigging ever seen. Did the British commitment to imperial defence imply an inability to operate against an enemy's coastline? On 8 February 1861 Vice-Admiral Sir Richard Dundas wrote to the Secretary of the Defence Commission, for the attention of the Duke of Cambridge and Lord (Sidney) Herbert, the Secretary for War, that "to prevent the passage of iron-cased ships" ("as exemplified in the French ship 'La Gloire'") into Portsmouth harbour floating batteries could be readily devised by converting ships-of-the-line. Though it would "not be desirable that they should fitted for permanent service at sea... they should be so adapted as to render it inexpedient that they should be detached to a distance..." The Defence Committee (again) disagreed. Such vessels would not be as effective as fixed forts, it defensively declared, and "the proposal to devote so large a portion of our naval resources to a special purpose...so far from increasing our security, will tend to weaken our strength by dividing our means of resistance." Indeed, it was not clear how ironclads might be used for coastal defence or

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[247] 12-2-1862, *CG*, 762.

assault. "It certainly appears to us a strange argument that, because by the introduction of iron-cased vessels, bombardment has become comparatively easy, and consequently, that iron-cased ships are required for protection, therefore, the defending vessels are to be deprived of the support of forts, and are to be put on an equality with an equal number, or on an inferiority with a greater number of a similarly equipped squadron of the enemy."[248]

By this reasoning it was perhaps fallacious for the Union Navy to concentrate on armoured batteries as well, whether for coastal assault or defence—with the important distinction, not mentioned by the British Committee, that it was not so much about 'equal numbers' of ironclads but their individual character, *based on their strategic function. All things* not *being equal in ironclad design, between coastal and global operational parameters, it remained to be seen whether or not a mastless ironclad "battery" would by its nature be superior to "iron-cased ships", if not also forts. For the U.S. Navy, it also remained to be seen whether its hasty reliance upon coastal defence, and therefore a superior ironclad battery, could be fully entrusted to the abilities of private contractors such as John Ericsson. Deprived of much of their practical seafaring experience in this unique situation, professional Union* sailors *were naturally dubious of "weapons platforms", much less "machines", as warships.*

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[248] *Letter Addressed by the Royal Commissioners on National Defences to the Secretary of State for War, Relative to the Proposed Substitution of Iron-Cased Vessels for the Forts at Spithead* (London: George Edward Eyre and William Spottiswoode, 1861), 3-11; see WO 33-10.

PART TWO

The Fulcrum of Hampton Roads

I. Hampton Roads and its consequences

When the Confederate ironclad *Virginia* finally did attack, on Saturday, 8 March 1862, the Union Navy was, surprisingly, fairly surprised. Not only were the frigates and sloops at Hampton Roads caught helpless, disabled or aground, but repeated broadsides of 9-inch solid shot against the ironclad's 38° sloping armoured casemate proved futile in preventing the 4-knot moving vessel to ram the *Cumberland* and then leisurely set the *Congress* on fire. The vital crossroads between Fortress Monroe, Norfolk, and the mouth of the James River in fact consisted of mostly disabled Union vessels, all wooden, many of which were sail only. The oaken heart of Union seapower was literally pierced with iron. Two powerfully armed Federal warships were destroyed in a matter of minutes, with over 250 casualties.[249] Even worse, the enemy was virtually untouched, and prepared to finish off the rest of the Union's seapower; bombard Fortress Monroe—perhaps into surrender—along with surrounding Union positions. In fact the *Virginia* might dominate the strategic nexus of the war.

Welles famously recounted in his diary how Lincoln's Cabinet panicked at the news. Secretary for War Stanton feared the *Virginia* would steam up the Potomac and shell Washington. Even though the Secretary of the Navy assured him the *Merrimack*'s old hull drew too much water, and therefore could not possibly ascend the Potomac to Washington, Stanton was doubtful. When Welles informed him the *Monitor* was en route to Hampton Roads and should already be there, doubt turned to scorn when Welles informed him the Union's ironclad champion only had two guns.[250]

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[249] As James McPherson points out, this was "more than the navy suffered on any other day of the war" and "a feat no other enemy would accomplish until 1941," *Battle Cry of Freedom*, 176. Donald Canney adds that "the circumstances were extraordinary: the survivors attest to the helplessness of both wooden vessels and their hapless crews in the face of an impersonal and impenetrable iron behemoth. The trauma of 8 March 1862 would haunt the Union navy for the remainder of the war," *Lincoln's Navy*, 218.

[250] Beale, *Diary*, 1: 61-7.

This was the result of a single converted ironclad, on its first day of operation.[251] For the Union Navy in early March, 1862, it was a disaster of the highest magnitude. Furthermore, it was well known that other rebel "rams" were under construction throughout the South; at New Orleans, Mobile, Savannah, Charleston, and on the Mississippi. The rapid mobilization of the North's maritime and industrial resources had produced a credible blockade covering roughly 3,500 miles of enemy coastline. Wooden gunboats had already launched successful strikes against the South's exposed, seaboard flanks. At Richmond, Confederate Secretary of War Judah P. Benjamin had dispatched his best soldier, General Robert E. Lee, to oversee the coastal defences of the Carolinas and Georgia.[252] Lee knew that Union seapower could pressure Richmond to divert precious manpower-resources away from its defence or operations in the West. Suddenly the situation appeared reversed. The rebels' technological "wonder-weapons" might yet outweigh the strength of the Federal fleet.[253]

Into this already historic maelstrom of naval warfare steamed the U.S.S. *Monitor* later that night.[254] News of her arrival, it was telegrammed to Major-General John E. Wool, commanding some 10,000 Union troops at the scene, "infused new life into the men."[255] The next morning, the two iron-plated steam warships duelled for the immediate fate of the stricken Union steam frigate *Minnesota*, and the control of Hampton Roads. Among the thousands of Northern and Southern spectators, crowded along opposite shores, who

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[251] See 7-4-1862, Mallory to Davis, *ORN*, ser. 1, vol. 7, 43.
[252] See Lee's subsequent 9-11-1861 report to Benjamin, *ORN*, ser. 1, vol. 12, 299-300.
[253] Fox had written to Lincoln on 4 March, however, that the *Monitor*'s trials were complete and she was on her way to Hampton Roads, 4-3-1862, Fox to Lincoln, LP Confederate President Davis was urged to use the *Virginia* offensively, up the Potomac if she were lightened enough; 28-2-1862, Douglas F. Forrest to Davis, *ORN*, ser. 1, vol. 7, 737-9.
[254] On March 4, Welles had ordered Captain John Marston, the senior naval officer at Hampton Roads, not to allow the *Monitor* "to go under fire of the enemies' batteries, except for some pressing emergency". The ironclad and her crew were untried, so "her commander should exercise his men at the guns, and in all respects prepare for serious work." Perhaps she would have been ordered to attack the *Virginia* at Norfolk. The following day, however, Welles telegrammed Marston to send the *Monitor* to Washington when she arrived; 4-3-1862, Welles to Marston, *ORN*, ser. 1, vol. 6, 678-9, 681-2.
[255] 8-3-1862, telegram, W.D. Whipple, Assistant Adjutant-General to Major-General Wool, *ORN*, ser. 1., vol. 7, 5.

witnessed this dramatic encounter was Gustavus Fox. He had come down from Washington to see for himself the contentious *Monitor*, scheduled to arrive from New York. There is little doubt that the experience fully "converted" the Assistant Secretary of the Navy to Ericsson's claims as well. In a telegram to Welles Fox briefly relayed the events:

> HEADQUARTERS, *Fortress Monroe---6:45 p.m.*
>
> (Received March 9, 1862.)
>
> The *Monitor* arrived at 10 p.m. last night and went immediately to the protection of the *Minnesota*, lying, aground just below Newport News.
>
> 7 a.m. to-day the *Merrimack*, accompanied by two wooden steamers and several tugs, stood out toward the *Minnesota* and opened fire.
>
> The *Monitor* met them at once and opened her fire, when all the enemy's vessels retired, excepting the *Merrimack*. These two ironclad vessels fought part of the time touching each other, from 8 a.m. to noon, when the *Merrimack* retired. Whether she is injured or not it is impossible to say. Lieutenant J. L. Worden, who commanded the *Monitor*, handled her with great skill, assisted by Chief Engineer Stimers. Lieutenant Worden was injured by the cement from the pilot house being driven into his eyes, but I trust not seriously. The *Minnesota* kept up a continuous fire and is herself somewhat injured.
>
> She was moved considerably to-day, and will probably be off to-night. The *Monitor* is uninjured and ready at any moment to repel another attack.
>
> G. V. FOX,
> *Assistant Secretary*
>
> G. WELLES,
> *Secretary Navy*[256]

Fifteen minutes later, Fox telegrammed John Ericsson, in New York, that his "noble boat" had "performed with perfect success". In the unprecedented, critical relationship between

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[256] *ORN*, ser. 1., vol. 7, 6.

man and machine in naval warfare, the officers and crew of 58 men (including Stimers) had handled their own wonder-weapon "with great skill".[257]

The *Monitor* was indeed shot-proof—but so was the *Virginia*. The rebel ironclad remained a serious threat. "I was the nearest person to her outside of the *Monitor*," Fox wrote to Welles, "and I am of the opinion she is not seriously injured." Any of the 11-inch gunboats still available Fox wanted sent to Hampton Roads.[258] It was now painfully obvious that only the biggest Union guns on hand might succeed in overcoming such armour protection.[259] In addition to the superiority of "iron over wood", the "revolution" in naval warfare manifested at the Battle of Hampton Roads was that concentrated broadsides of lighter cannon were useless in comparison with single, overwhelming blasts.[260] In two consecutive days of firing against the *Virginia*, the *Minnesota* alone expended 78 10-inch and 169 9-inch solid shot, without result.[261] The first action between ironclad ships was thus a famously *frustrating* one, with neither antagonist able to wield a decisive advantage over the other.[262] As such, the stage was immediately set for new ordnance, ship design, and tactics in the age of steam.

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[257] *ORN*, ser. 1., vol. 7, 7.

[258] 9-3-1862, telegram, Fox to Welles, *ORN*, ser. 1., vol. 7, 7.

[259] For the C.S.S. *Virginia*, this consisted of two layers of rolled iron armour plate, each 2-inches thick, angled at 38° and supported by oak and pine. In response to Lincoln's inquiry as to whether the *Virginia* could ascend the Potomac and attack Washington, Dahlgren replied that only a vessel drawing less than 22 feet might reach the city, and that he was mounting his sole 11-inch gun at Giesboro Point to protect the arsenal, at a range of 50-yards from any passing vessel. "Shot of 170 pounds at 50 or 100 yards will be apt to do something," 9-3-1862, telegram, Dahlgren to Lincoln, *ORN*, ser. 1, vol. 7, 76-8.

[260] The "performance, power, and capabilities of the *Monitor*," Welles wrote to Worden, "must effect a radical change in naval warfare." What this might involve the Secretary did not specify, only noting that Worden's vessel with only 2 guns had repelled "a powerful armored steamer of at least eight guns" and that this action had "excited general admiration and received the applause of the whole country," 15-3-1862, Welles to Worden, *ORN*, ser. 1, vol. 7, 38.

[261] 10-3-1862, Charles W. Homer, Gunner, to Captain G. J. Van Brunt, *ORN*, ser. 1, vol. 7; also 10-3-1862, Brunt to Welles, *ORN*, ser. 1, vol. 7, 11-12. The *Monitor* later reported firing "forty-one solid cast-iron shot in her engagement with the *Merrimack*, equally divided between guns 27 and 28," 16-3-1862, Lieutenant William Jeffers to Goldsborough, *ORN*, ser. 1, vol. 7, 28.

[262] Major-General Benjamin Huger, Commander of the Confederate Department of Norfolk, recognized the long-term problem, however: "As the enemy can build such boats faster than we, they could, when so prepared, overcome any place accessible by water. How these powerful machines are to be stopped is a problem I can not solve. At present, in the *Virginia*, we have the advantage; but we can not tell how long this may last," 10-3-1862, Huger to General S. Cooper, Adjutant and Inspector General, *ORN*, ser. 1, vol. 7, 54-5.

On 10 March the *Minnesota* was finally got off ground and resumed position back at the entrance of the Roads, off Fortress Monroe. The *Monitor* followed her up. That day Fox and General Wool inspected the battle-scarred ironclad and conferred with her officers. Wool had already been telegraphed by General George B. McClellan to prepare to evacuate the Union position at Newport News, if the Navy lost control of the Roads, and fall back on Fortress Monroe, taking care of the valuable 12-inch "Union Gun"—the only one of its kind in existence.[263] Undoubtedly, Fox was shown the Army's massive, experimental rifled gun and its companion 15-inch calibre smoothbore as they were both prepared to assist in the defence of the fort.[264] Two of his telegrams made on the following day confirm that the Assistant Secretary had made the important connection between the corporeal events of recent days and the Union ironclad program's course for the future. The first, to Lieutenant Henry Wise, Assistant Inspector of Ordnance at the Navy Department, requested Dahlgren to assist Brigadier-General J. W. Ripley (the Army's Chief of Ordnance) in the casting of "some projectiles for the Union gun here."[265] The second one, to Dahlgren, clearly reflected Stimers' frustration in not being allowed to fire the special wrought-iron shot specially cast for the *Monitor*'s 11-inch guns but ultimately not allowed for Dahlgren's fear that the guns would be over-strained. "It is the only thing that will settle the *Merrimack*," Fox persisted. Additionally, "We must have more of these boats with 15-inch guns, and you must go ahead with your furnaces at once to make them to stand solid shot."[266]

Dahlgren replied that the risk of an 11-inch gun burst within the *Monitor*'s turret—as a result of firing wrought-iron shot—outweighed their use. "I am only awaiting the action

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[263] 9-3-1862, telegram, McClellan to Wool; 10-3-1862, telegram, Wool to McClellan, *Official Records of the Union and Confederate Navies in the War of the Rebellion*, 30 vols., (hereafter "*O.R.N.*"), ser. 1, vol. 7, 75-6, 84.
[264] 11-3-1862, telegram, Fox to Welles, *O.R.N.*, ser.1., vol. 7, 91-2.
[265] 11-3-1862, telegram, Fox to Wise, *ORN*, ser. 1, vol. 7, 92.
[266] See the original 11-3-1862 telegram, from Fox to Dahlgren, found in the DP

of the Senate and then for as large guns as you want with solid shot."[267] The day before the *Virginia*'s attack, Dahlgren wielded his authority in ordnance matters in response to Fox's "proposition to build a vessel like the 'Lancaster' so as to carry 20 guns of XI in. on the Gun deck, in lieu of 22 of IX in., and to retain the two XI in. on the Spar deck." The increase, he calculated, would add from 170 to 280 tons' weight to the vessel and nearly 80 extra men to the crew. Twelve 11-inch guns could only therefore be contemplated, six to a broadside. But whether these should be on a regular broadside-carriage on an enclosed gun-deck or an open-deck pivot was another matter, especially since such large guns would have to be stowed at sea "in two line fore and aft on each side of the middle line of the deck", parallel to the ship's side. "You may safely rely on one thing," he concluded to Fox: "that the power of a ship of War may always be in proportion to her capacity, And that the largest ship can always be made the most powerful in offense as well as in defense."[268]

The events at Hampton Roads had Dahlgren rather eating his words later. Ericsson's published remarks on the ironclad duel, that the *Monitor*'s 11-inch guns should have been aimed more at the *Virginia*'s waterline, Dahlgren argued only proved his point; that the lack of wrought-iron shot would not have made any positive difference in the battle's outcome. "That the use of but one XI in. gun at a time should have effected so much against a vessel 4 times the size with perhaps 6 or 8 times the Ordnance power, presenting an entire oblique surface to the *Monitor*'s aim is so good a result that it seems to me the

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[267] 11-3-1862, Dahlgren to Fox, *ORN*, ser. 1, vol. 7, 92-3. Both the 15-inch smoothbore gun and a rifled 12-inch were being tested at Fortress Monroe. "Since the recent naval engagement, it is thought that nothing can stop the *Merrimack* here except the *Monitor* and the big guns (the 15-inch and 12-inch). General Wool is desirous of having both of these guns mounted on the beach and plenty of ammunition for them as soon as possible,"; 11-3-1862, T. G. Baylor, First Lieutenant of Ordnance, to Ripley, *ORN*, ser. 1., vol. 7, 93-4. Nicknamed "Floyd" the 15-inch prototype was ordered by Stanton to be renamed the "Lincoln Gun"; 11-3-1862, telegram, Stanton to Wool, *ORN*, ser. 1., vol. 7, 94.

[268] 7-3-1862, Dahlgren to Fox, DP.

excess of hypercriticism even to suggest that more might have been done..."[269] Here was both veiled criticism of Ericsson, the now wildly-popular civilian inventor, and yet an acknowledgment by Dahlgren that Ericsson's principles—embodied in the *Monitor*—had somehow overturned his own.[270] The smaller, lighter-draft turret vessel had succeeded in driving away the large, deep-draft, broadside-armed opponent. Various proposals submitted by Dahlgren before the battle emphasized either converting shallow draft gunboats into armoured central battery ironclads or lightly protecting the new double-ender gunboats with their open-deck pivots.[271] Now Ericsson and Fox were rushing forward with plans of even more heavily armoured turret-mounted guns, of even heavier calibre—designed to inflict singular mortal blows against ostensibly "more powerful" ironclads.

In this regard Ericsson's proposal to Welles of 23 December 1861 to build six improved monitors held an important advantage over rival designs—particularly the Bureau's—since arming them with 15-inch guns was a specifically mentioned feature. "The *Monitor* was not half completed before I saw clearly what might be done," Ericsson wrote to Fox. He had been perfecting them since early that December at least, anticipating many of the suggested improvements Stimers offered following the *Monitor*'s trial by fire. Foremost among these was the placing of the pilot house on top of the turret, rather than the

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[269] 17-3-1862, Dahlgren to Harwood, RG 74, Entry 201, Item 5, Box 2. Dahlgren quickly added that "Of course I would not be understood as wishing to depreciate the high merit of the projector and builder of the Monitor which so astonishingly endured the brunt of the Merrimack's fire." 12-3-1862, telegram, Ericsson to Fox, *ORN*, ser. 1, vol. 7, on aiming at the *Virginia*'s waterline.

[270] "Now comes the reign of iron—and cased ships are to take the place of wooden ships and Stone Forts—Battering Rams to stand in lieu of Ordnance," from Dahlgren's curious history-essay, dated "March 8, 1862" but nevertheless finished afterwards. Dahlgren somewhat unfairly comments "Upon the untried endurances of the *Monitor*, and her timely arrival did depend the tide of events—Two circumstances which in the particular case amounted to Accidents." In another sense, both the *Monitor*'s defensive capabilities and her immediate deployment to Hampton Roads were by design.

[271] See 7-10-1861, Dahlgren to Welles, RG 74, Entry 201, Item 5, Box 2, for Dahlgren's proposal to convert the screw-gunboat U.S.S. *Pawnee* with iron plating "not less than 2 inches thick, nor more than 3 inches." This would "extend along the sides of the section where the body of the vessel begins to fall off into the fine lines of the ends, the extremes of the side plating to be connected across the interior by a transverse partition of plating." See Canney, *Lincoln's Navy*, 66-7, for a description of the *Pawnee*, originally armed with four 11-inch pivots but eventually changed to twelve 9-inch broadside guns. See 16-10-1861, Dahlgren to Harwood, RG 74, Entry 201, Item 5, Box 2, for his suggestion to partially armour double-ender gunboats.

isolated, vulnerable box-like structure on the *Monitor*'s forward deck. This would be cylindrical too, composed of eight inches of laminated 1-inch plates, and fixed in position when the turret revolved. But "on account of the most unexpected march which Mr. Isherwood stole upon me in relation to my cylindrical, impregnable, steam revolving turret," Ericsson explained, "I have kept my own counsel."[272]

In the meantime, the North reacted to news of the two-day naval battle at Hampton Roads with mixed feelings of shock, amazement and joy. After relating his own account of the *Monitor*'s performance, Stimers congratulated Ericsson upon his "great success":

> Thousands have this day blessed you. I have heard whole crews cheer you. Every man feels that you have saved this place to the nation by furnishing us with the means to whip an ironclad frigate that was, until our arrival, having it all her own way with our most powerful vessels.[273]

To Commodore Smith, a man nearly as responsible for the *Monitor*'s completion as her builder, Stimers had to express his condolences. The Bureau Chief's son, Joseph, was among the killed in action. "I knew him well; indeed, we were shipmates in that same *Merrimack* when she sailed under an honorable flag—by people who did not steal her." At sea the *Monitor* needed higher ventilation pipes, but otherwise he considered "the form and strength of the vessel equal to any weather I ever saw at sea." Waves rolled smoothly uninterrupted "right across her deck; it looks to the sailor as if his ship was altogether under water, and it is only the man who has studied the philosophical laws which govern floatation and stability who feels exactly comfortable in her during a gale of wind." The

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[272] 14-3-1862, Ericsson to Fox, FP. "From the new suggestion in Congress on the subject of gunboats," Sargent wrote to Ericsson, "it would seem to me that they have been trying to steal your thunder—and I only hope that they will not spoil it in the Stealing." Only low-freeboard ironclads could insure their machinery from penetrative hits. 7-3-1862, Sargent to Ericsson, EPLOC 12-3-1862, telegram, Ericsson to Fox, *ORN*, ser. 1, vol. 7.

[273] 9-3-1862, Stimers to Ericsson, *ORN*, ser.1, vol.7, 26-7.

Chief Engineer also considered laminated amour plating better than "solid forged plates".[274]

The Battle of Hampton Roads also gave John Lenthall of the Bureau of Ship Construction & Repair new hopes for his own scheme of turreted ironclads. One of the chief objections the previous winter was their requirement for (foreign-built) solid, slab armour plates. Now, "in justice to the Bureau", Lenthall wrote to Welles, the Department would reconsider "a vessel built on the principles of the plan then prepared". The Novelty Iron Works, who built the *Monitor*'s laminated iron turret, was offering to build a Bureau turret ship in "5½ months for the sum of Five hundred and thirty thousand dollars, suggesting a modification in the plating which recent experience will justify..."[275] But this would either overturn the sudden popular success of the *Monitor*'s inventor, and his own proposal for six improved sister-ships of the same basic design—or introduce a rival turret-ship system of higher freeboard and Coles-cupolas.

At any rate, Lenthall's proposals were again too reactionary, too slow to effectively compare with Ericsson's. Nothing was mentioned of increasing the firepower of the former's turret ship, from one 11-inch gun per turret (similar to Coles' ideas of only one 110-pdr Armstrong per turret on the *Royal Sovereign* conversion and the purpose-built *Prince Albert*) to two; or more importantly, especially after the indecision of the *Monitor*'s guns against the Virginia's armour protection, of substituting 15-inch guns for the 11-inch. Nor was the other drawback of the Bureau's turret vessel prototype, it's relatively higher freeboard and therefore greater area of hull to be protected—and

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[274] 17-3-1862, Stimers to Smith, *ORN.*, ser. 1, vol. 7, 27.
[275] 13-3-1862, Lenthall to Welles, RG 19, Entry 50.

therefore also greater expense, difficulty, and delay of construction—addressed by the Union Navy's chief of ship construction.[276]

On the same day Lenthall wrote to Welles, Ericsson wrote to Fox of his delight that the proactive Assistant Secretary, fully converted from the Bureau's vision to Ericsson's, seriously considered 20-inch calibre guns for the "swift, impregnable turret carrier" which Ericsson was already busy designing. The concept of alternative "visions" here is crucial: whereas the Bureau (and its advocates) had its eye more on deploying turret ships for coastal assault—attacking Charleston for example—Ericsson, Fox and their supporters were focusing ever more on the problem of strategic coastal defence—deterring foreign intervention. This included the construction of even larger monitors with ocean-going pretensions. "With all my heart" Ericsson wrote Fox, "if you can make the guns I [will] most willingly supply the gear for supporting, working and housing the same. Enforce your plan of employing such heavy ordnance and in twelve months we can say to England and France, leave the Gulf! We do not want your Kings and monarchical institutions on this continent."[277]

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[276] See the problems Lenthall faced, for example, when trying to procure the 4½-inch thick plates for the *Roanoke*-conversion; 24-6-1862, Lenthall to Welles, RG 45, Letters Rec'd. Thomas Rowland of the Continental Iron Works at Green Point directly complained that the cost of fitting Ericsson's lighter plates bore "no comparison...with that of applying 4½ in. plates to the side of a hull, when said plates are obliged to have compound curves..." In his view "few Engineers in this country have a proper conception of the difficulties to be surmounted, and the expenses which must necessarily be increased, in cladding the sides of any of our Steam Frigates..." See also 1-1-1862, *Scientific American*, 277.

[277] 13-3-1862, Ericsson to Fox, FP.

II. Super-monitors, super-guns

On the morning of 15 March 1862 Fox met with Ericsson in New York. Their conference all but hammered out the future shape of the Union's ironclad navy for the rest of the Civil War and beyond. Ericsson wrote soon after the Assistant Secretary's departure he was "much gratified...to find how fully you appreciate the advantage of drawing the supply of air, in the intended swift turret carrier, through pilot house and turret." With a projected 5,000 horsepower engine there would be more than enough artificial ventilation available through a separate, armoured vent-pipe above deck "when chasing an enemy with full power" at sea. This promised to resolve any doubts concerning the habitability of new monitors. The second main concern, low freeboard, was closely connected to the first, and therefore the solution of the former meant the acceptance of the latter. Ericsson was jubilant: "Your support in relation to the flush deck only 18 inches out of water is most encouraging and will be a tower of strength in the battle with prejudice, which must be waged, before the good cause is triumphant."[278]

Much of the credit for the acceptance of the monitor system of ironclads belongs to Fox, whose ideas often proved to be as far-sighted and free from convention as Ericsson's. Such a kindred spirit was nothing new for the Swedish engineer-inventor, however, who must have recalled his initial friendship with Stockton some 20 years before. Whereas then Ericsson was new to the country and vulnerable, his personal status since Hampton Roads seemed as secure as, ironically, the country's was not. But this did not prevent Fox from honestly confronting him with proposed modifications to his plans. "When I spoke to you last Summer of a vessel of extraordinary speed and one 20 inch gun, invulnerable, so far as the tower was concerned, as a fit match for the *Warrior*," Fox wrote on his return to Washington, "I did not think you would take the *Monitor* as a

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[278] 15-3-1862, Ericsson to Fox, FP.

type." Events since then had compelled him "to consent fully in the plans which you showed me in New York Saturday." His "suggestions of detail" he therefore trusted Ericsson would take "in the kind spirit which prompted them." These included the specific incorporation of a ram; a 12-foot height for the ventilation pipe of the seagoing monitor, forward of the stack; an iron cage around the propellers to prevent fouling; "a nice iron gallery...abaft the smoke pipe for promenade", 8-feet high; and a staggering 25-inch thick turret. Always prone to optimism, however grim, Fox regarded the Navy's losses at Hampton Roads as useful in "awakening" the public mind (and opening the purse-string of Congress). "Most fortunately we have met with a disaster—this is the Almighty's teachings always—success never gives a lesson."[279]

Far from feeling insulted, Ericsson regarded Fox's suggestions as "genius". He was in a good mood to be sure, and it never hurt to flatter equally enthusiastic patrons. Fox being "a perfect master of the subject", Ericsson pledged "we shall now have a navy that will place the United States at the head of Naval powers." Fox was rightly suspicious this might prove easier said than done, even if with the full backing of Congress. But Ericsson assured him, perhaps rightly too, that "the building of a dozen Monitors is a mere trifle with the enormous engineering capábilities of the United States at this moment."[280]

There were, however, major qualifiers to this statement. If "a dozen Monitors" meant simple reproductions of the original, including its guns, building them might have indeed been fairly painless. If more were needed, and of a more complicated design and demanding armament, there would be complications. The fixed price of materials and availability of skilled labour were also requisite. Yet in the early spring of 1862 there

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[279] 18-3-1862, Fox to Ericsson, FP.
[280] 19-3-1862, Ericsson to Fox, FP.

was still every reason to expect an early end of the war; Federal forces were poised in both the eastern and western theatres to deliver simultaneous crushing blows to the Rebellion. Fox replied he wanted "25 inches for the fast boats that will cross to the enemy's country," because he foresaw "that the most enormous calibre of ordnance must immediately come into use, and we must prepare for them, not for anything in existence at this time."[281] Fox knew it would take at least a year before such fearsome naval weapons were ready for use. Maybe by then it would be England's turn to yield to the spread of Lincoln's American democracy?

Almost immediately the qualifiers set in. On 22 March Fox wrote Ericsson he preferred two turrets in his "three hundred & fifty feet vessel". Two days later he added twin-screws. In this he "would risk a voyage around the world, and a battle with the whole iron fleet of England."[282] Oddly enough, four years later Fox *would* take a twin-screwed, double-turreted monitor, the U.S.S. *Miantonomoh*, across the Atlantic to face British ironclads—though in peace; the London *Times* recounting Fox's challenge that "if the experiment could be made without exciting ill-feeling on either side, he would allow the whole ironclad fleet of England to open fire on the *Miantonomoh*, and continue it for two days, provided that the *Miantonomoh* might afterwards be allowed to have ten hours' firing at our ships in return."[283] Though Ericsson wrote he found his patron's "boldness in the matter…a source of gratification," he also had to stress the importance of keeping Dahlgren's new 15-inch gun to Ericsson's exacting proportions to fit his 20-foot diameter turret. He was in the meantime settling for 11-inch thick laminated turrets for the six improved monitors underway, capable of an additional outer plate of solid four-inch thickness, as soon as Northern mills could readily produce them.[284] But on the same day

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[281] 20-3-1862, Fox to Ericsson, EPLOC.
[282] 22-3-1862, Fox to Ericsson, EPLOC; 24-3-1862, Fox to Ericsson, FP.
[283] 16-7-1866, London *Times*.
[284] 22-3-1862, Ericsson to Fox, FP.

that Dahlgren complained to Fox of delays in finishing the specifications for the 15-inch gun—due to constant wartime demands and a shortage of staff—Ericsson wrote him his call for twin turrets and screws "have depressed me in spirit more than any occurrence..." While before he "had supposed we were on the same track", Fox's new ideas he exclaimed "convince me that our ideas are as opposite as the poles." The topic was "too vast" to go into at present; in the meantime he enclosed a plan for a 26-foot diameter turret housing a massive 20-inch calibre gun of proscribed length. He was, finally, "very curious to see Captain Dahlgren's guns and fear greatly he will require more width than the turrets will admit of."[285]

It was impossible to reconcile so much in a single person. Even if Fox agreed completely and always with Ericsson's vision, that alone was in growing danger of distraction from other interested parties who likewise shared common ends but opposing means. As reported by *Scientific American*, on 18 March the New York City Chamber of Commerce, along with Mayor Peter Cooper "and delegations from the Philadelphia and Boston Boards of Trade" solicited Ericsson's advice. Forts were considered ineffective next to "several light iron-clad vessels to carry 15-inch guns"—"to resist such a vessel as the *Warrior*".[286] Meanwhile, various state governments of the North were busy preparing information for Congress on the series of nationally strategic canals under proposal. "You will much oblige many parties here, amongst our prominent merchants in particular if you will favor me," Richard P. Morgan of Chicago wrote Ericsson, "with a statement as to the least draft of water admissible for vessels like the *Monitor* designed to cope with

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[285] 25-3-1862, Dahlgren to Fox; and Ericsson to Fox, FP.

[286] 29-3-1862, *Scientific American* (vol. 6, no. 13), "Harbor Defences", 203. See also Ericsson's quote on page 194. Ericsson wrote to Fox it was his "duty yesterday to kill, if possible, the scheme of building a Monitor for the harbor. I offended several of our great men here, but I feel I have served the country by preventing an imperfect thing from being got up at the moment when the strong arm of the government, directed by skill like your own, is carrying the new system into practice," referring to even more ambitious free-ranging versions; 19-3-1862, Ericsson to Fox, FP.

such craft as might be brought into the Lakes by the British Government through their Canals in Canada."[287]

Lenthall and Isherwood were also dismayed with the larger strategic direction the Navy's undeniable and growing reliance upon Ericsson represented. Monitors, according to the professionals, could not possibly "constitute a navy or perform its proper functions." Seagoing ironclads of the largest possible dimensions, built in expanded Government dockyards equipped for iron shipbuilding and large-scale, heavy armour-plate manufacture, would be better suited to America's long-term interests. "Wealth, victory and empire are to those who command the Ocean, the toll gate as well as the highway of Nations; and if ever assailed by a powerful maritime for, we shall find to our prosperity, if ready, how much better it is to fight at the threshold than upon the hearthstone."[288] Yet the question remained for Welles and the Administration whether or not the United States during the Civil War could rightly afford such a strategy.

Before the fateful month of March 1862 was out this was thus far from settled or free of complications. Fox may in fact have been trying to reconcile the best of the old Bureau design features (twin screws and turrets) with Ericsson's own (low freeboard; a steam-rotated turret mounting the heaviest possible guns). At any rate, Welles tried to sum up the immediate lessons of Hampton Roads—and capitalise on them—in his 25 March appeal to the House and Senate Naval Committees. Drawing upon the recent arguments from both the bureau chiefs and his own Assistant, he asserted that "The navy, as it exists at present, cannot successfully contend against a power employing iron-clad vessels, and consequently cannot meet the requirements of the country." It was therefore time to

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[287] 17-3-1862, Morgan to Ericsson, EPPA. See also 15-3-1862, S. H. Sweet, Deputy State Engineer and Surveyor, to Commodore Joseph Smith, on possible ironclads for canal transport; and Smith's subsequent telegram inquiry to B. H. Bartol, care of Merrick & Sons, Philadelphia, for building "the wood work of a gunboat two-hundred by forty-eight by twelve feet, in sixty days. Plates can be had in four weeks. Engines in sixty days," 15-3-1862, Smith to Bartol, RG 45, Entry 464, AD, Box 51.
[288] 17-3-1862, Lenthall and Isherwood to Welles, RG 45, Letters Rec'd.

initiate the "construction of armored vessels on a scale commensurate with the great interests at stake." Another public advertisement, dated 20 February, had been placed calling for submissions of plans "which are now being received, developing the ingenuity and skill of our countrymen," and the Secretary had "faith they will produce models for a class of vessels for home defence and for sea-service..." This statement already suggested a predisposition to Ericsson's own efforts rather than the Bureau's; it also served to politically confirm the Navy was indeed fully supportive "of the people themselves". Additionally, Welles called for $500,000 for improved gun making facilities at the Washington Navy Yard (and assistance for Dahlgren); and a new (monitor) program of light-draft ironclads for river service, a 15-inch gun class for harbour defence and coastal operations, and a 20-inch gun class for ocean-going purposes. Curiously, he also noted the need for "mechanical" obstructions for full harbour defence against a concentrated, superior naval force, not just forts and a few harbour defence floating batteries. Finally, it was necessary for a $100,000 appropriation for iron target tests, Dahlgren's old request; a round $30 million for all of the above.[289] Significantly, this was the price-tag for getting the nation ready for a major naval war with one or more European powers, not simply winning the war against the Confederacy.

The day after Welles had written to Congress he appointed Smith, Lenthall, Isherwood, and civilian naval architect Edward Hart to form a new Ironclad Board to review the advertised ironclad proposals; Dahlgren finally sent his plans for a naval 15-inch gun to Fox; and Ericsson addressed the Assistant Secretary's preferences for twin screws and turrets.[290] "I cannot give up the idea, which I have cherished for some time," Ericsson wrote, "of building a war vessel under your auspices, as I cannot entertain a doubt that

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[289] 25-3-1862, Welles to Hale and Sedgwick, RG 45, Entry 5; and 37th Congress, Senate, Mis. Doc. No. 70, "Letter of the Secretary of the Navy", 1-3. Congress only authorised $25,000 for iron target tests; 3-4-1862, *CG*, 1514.

[290] 26-3-1862, Welles to Smith, Lenthall, Isherwood and Hart (possibly "Hartt"), RG 45, Entry 13; 26-3-1862, Dahlgren to Fox, RG 74, Entry 201, Item 5, Box 2. Smith's report to Welles, dated 9-4-1862, also mentioned engineer Daniel B. Martin as a board member; RG 45, Letters Rec'd.

you will after carefully looking into the subject, abandon the double propeller system as well as your last proposition of employing two turrets." Fully confident of his own expertise, the builder of the *Monitor* reminded Fox it was a mistake to always defer to British customs, which were often founded on erroneous principles. Indeed, everyone was new in the ironclad game. "The English are now on the wrong track", he asserted. "Put the weight of Coles' 6 turrets and 12 guns into one turret with two guns and you will defeat him in two rounds." Nor was Ericsson afraid of critiquing Fox's "argument in favor of two propellers", which he believed was "not strong enough." The principle of maximum concentration could also be applied in this regard, since a single shaft would be stronger than two smaller ones in the same hull, and could be more fully protected. "In relation to the superiority of a single turret I would have published a statement long ago," he added, "but for the fact that our enemies would be taught how to beat us. As long as England builds many-turreted vessels we can defy her, for our single vessel such as I have sent you a model of, with your two 20 inch guns and 2 feet thick turrets, can destroy the whole English navy in open water." It was a simple matter of calculation.[291]

By 1 April 1862 Ericsson was beginning to realize the extraordinary pressure he was under; to furbish the six *Passaic*-class ironclads to insure "impregnability" for the Union, and to finish off plans for a veritable super-monitor that could finish off British naval supremacy. The task of designing the latter, however, which Ericsson proposed to name the "Dictator", required specs for a 20-inch gun which Dahlgren was loathe to provide.[292] Even after finally submitting amended plans (with their trunnions) for a 15-inch gun to fit within Ericsson's 26-foot diameter turrets, Dahlgren could not resist protecting himself by formally notifying Harwood, "that this can only be considered as an experiment on a large scale, unsupported by any of the data usually considered important to the

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[291] 26-3-1862, Ericsson to Fox, also 28-3-1862, Fox to Ericsson, and 29-3-1862, Ericsson to Fox, FP.
[292] 1-4-1862, Ericsson to Fox, EPPA.

introduction of new ordnance, and, for a piece of this size, indispensable." In Dahlgren's opinion the safety of the gun was now dependent upon its proper forging, and therefore the responsibility of the original 15-inch Rodman's *manufacturer*—"the same kind of iron...the same grades of that iron, the same process of casting...the same tensile strength, density and other characteristics"—not his own modified version of it.[293] Ericsson, at the same time, was worried about the contractors—and the Navy—in providing the adequate number of 15-inch guns even for the Passaics. "I fear these will not be done in time", he wrote to Fox, "and if so our impregnable fleet will not amount to much."[294] Even young Oliver Batcheller realized the significance and potential of the new Yankee invention; "I trust now," he wrote to his father on April 3, "that all our harbors will be protected by iron clad 'Monitors' after which we can look for some form of 'iron machines' which will place us on an equal footing with France & England in foreign waters."[295] Ericsson's close confidant, Boston attorney John O. Sargent, went still further. The success of the *Monitor* ensured "you will enjoy something a little earlier than the posthumous reputation which you were always sure of." The London *Times* was in state of panic, and "if North and South would leave off fighting each other [and] get into a war with France and England," Sargent wrote, "you would have a better field for your operations and I should feel a little easier in mind and body." Saving the Union was one thing, but if Ericsson "could add to it the title of the Conqueror of England and France" his "ambition would probably be full."[296]

The Bureau of Ordnance meanwhile responded to Smith's concerns about the ironclads' various armaments by recommending a Board to examine the ironclads in question, both

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[293] 7-4-1862, Dahlgren to Harwood, RG 74, Entry 201, Item 5, Box 2. Harwood duly informed Welles that any further demands for guns of even greater calibre, etc., would have to be met in turn by "greater space in the turrets or other modifications in the plans of iron clad vessels", 8-4-1862, Harwood to Welles, RG 45, Letters Rec'd.

[294] 1-4-1862, Ericsson to Fox, EPPA. There was also apparent confusion as to whether their armament would consist of 15- or 12-inch calibre guns; see 5-4-1862, Smith to Welles, RG 45, Letters Rec'd.

[295] 3-4-1862, Batcheller to his father, BL.

[296] 8-4-1862, Sargent to Ericsson, EPLOC

those already under construction and still under consideration. Harwood candidly informed Welles he found "the sudden introduction of so many different calibres objectionable," and could not "perceive...any good reason exists for adopting XII inch cast iron guns for the iron-clad vessels."[297] Indeed, as Fox wrote to Ericsson the same day, Dahlgren was already busy with the "big guns", "we must stand to that."[298] Far from ignoring the habitability of the new monitors the Assistant Secretary was deeply concerned. "It was blowing a gale during my whole visit and the little *Monitor* was rather uncomfortable being pretty well under water. Her deck leaks some and as the iron cannot be removed, this point should be looked to in others." Simple additions such as light deck platforms and "a tarpaulin tent to enable Jack to take his segar [sic] would render him more comfortable and contented." "As I wrote you before," Fox stressed, "these low craft must be made perfectly comfortable for all hands in all weathers if we wish to succeed in them as regular cruisers, a point I desire to obtain." Perhaps a testing a mock-up turret against a 15-inch gun would shed light on other issues as well. Ericsson replied that "What we are now building will be tight. Jack will also be made comfortable this time. Yet let me say that when actually face to face with the enemy awaiting action any moment, the hatches must be closed excepting on turret." A target-test Ericsson also agreed might be useful. "Of course if we do not like to look at the scars we produce, we can put on new plates to hide our bruises." More significantly for Ericsson, at least, news was coming back of England's reaction to the battle of Hampton Roads and the *Monitor*. "They imagine their *Warrior*s impregnable. Why, our new Monitors with their 450 pound balls, will sink the boasted Ironsides in two rounds, nor will their applying also 15-

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[297] 15-4-1862, Harwood to Welles, RG 45, Letters Rec'd. The idea of a 12- as opposed to 15-inch gun may have stemmed from Ericsson himself, given his original "Oregon" gun for the U.S.S. *Princeton*; a banded, muzzle-loaded 12-inch calibre gun of wrought iron. Oddly enough, on 28 April Dahlgren submitted tracings of a XIII-inch gun to Fox, "the dimensions of which will suit the same Turrets as those intended to receive the XV in. guns," DP. "Captain Ericsson does not expect to mount either gun indifferently I suppose," he added four days later, "but to put one class in one Turret and another kind in another turret." If all the turret portholes were bored to fit 13-inch guns, Dahlgren felt "it may not be difficult to enlarge it for the 15 in.," 30-4-1862, Dahlgren to Fox, FP.

[298] 15-4-1862, Fox to Ericsson, FP.

A PROMISE FULFILLED.

1851.

BROTHER JONATHAN. "There, JOHNNY, that's the way to build a Yacht! Some of these days I'll show you how to make a Man-of-War."—(*See London Punch, September*, 1851.)

1862.

BROTHER JONATHAN. "There, JOHNNY, I said I'd tell you how to make a Man-of-War! I guess that's about right! How do you like it?"—(*See London Times, April*, 1862.)

-inch guns help the matter. We can stand that pill, but they will perish under its operation."[299]

Finally, in regards to wood versus iron hulls for the new ironclads, Ericsson disagreed with Fox's assertion that "Wood under water does not rot." The Assistant Secretary had "only to carry out the plan" which Ericsson "urged on the Department some 16 years ago, to build sheds under which to place your Iron Gun boats, on dry land, with a convenient inclined machinery for putting your fighting craft in and out of water at pleasure." Stimers was "much struck" by the idea when Ericsson repeated it the previous day. "A dozen gun boats under houses" might be thus be kept in "good working order for 50 years at less annual expense than a single gun boat" otherwise. "In times of trouble a fleet may on this system be launched at a days notice." Previously this scheme was regarded as "quite 'visionary'"; if only Fox would "give the subject a deliberate consideration" he would "find the idea not so stupid as it was once pronounced." Likewise, the notion of fitting the new monitors with permanent deck vents, perhaps even a superstructure—to facilitate better living conditions, especially for long-distance cruising—Ericsson strongly opposed. Even an elevating hatch would be better. "Let us take care not to fritter away the grand principle of a perfectly flush deck within 18 to 20 inches of the water's edge and absolute success will attend our labors." Again Ericsson specifically promised what this "absolute success" would mean, for by "Adhering to this idea we are masters of the sea within a year."[300]

There could be no doubt who the real adversary was in this pursuit of naval power. Two days later, Ericsson took the bold step of addressing William Seward, the U.S. Secretary of State, with one of the most revealing declarations of Union ironclad policy during the

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[299] 15-4-1862, Fox to Ericsson, FP; 16-4-1862, Ericsson to Fox, FP.
[300] 15-4-1862, Fox to Ericsson, FP; 21-4-1862, Ericsson to Fox., FP.

American Civil War. "The state of the naval defences of the country being so intimately connected with its inter-national relations," he wrote:

> I deem it my duty to report to you that under orders from the Secretary of the Navy, keels for 6 vessels of the Monitor class of increased size and speed have already been laid...The amount of mechanical force now concentrated on the work is quite unprecedented.
>
> The speech of the Duke of Somerset in the House of Lords on the 4th instant and the news from England to-day in relation to the expedients now adopted by the Admiralty to avert the dangers to England suggested by the recent developments in naval warfare, tend to prove that this country now occupies the vantage ground. The six vessels above alluded to will be absolutely impregnable against even the last "14-ton gun" of Armstrong, in consequence of their sides being only 18 inches above water, a circumstance which converts their decks into bulwarks supporting the armor plate with resistless force. Our turrets, too, are absolutely impregnable as we now make the same 11¾ thick—all iron. Our guns of 15-inch calibre will throw 450-pound shot. To this enormous projectile the *Warrior*, *Black Prince* and the razeed line-of-battle ships, will present only a five-inch iron plating. This thin armor may be said to afford no resistance to our 450-pound Shot. Under its terrific impact, the sides will be actually crushed in. England is now committing the serious blunder of attending to the protection of her guns alone by the so-called cupolas. She overlooks the safety of the vessel intended to carry her guns.
>
> The British Admiralty, it would appear, can only see in the *Monitor* a revolving turret (erroneously supposed to be of English origin), forgetting that without the peculiarly constructed hull of the *Monitor*, her cupola Ships will stand no chance in a conflict with this country.[301]

Nothing gave more impetus to Ericsson and the Union's preference for monitor-type ironclads than England's own reaction to the Battle of Hampton Roads, and the controversy between Coles and the Government over turret-ship ironclads for the Royal Navy. "To save time, and repetition" Ericsson enclosed a copy of his letter to Seward to Fox. Perhaps the inventor was circumventing the Navy's authority, if not pre-empting its freedom of choice in terms of ironclad policy? It did not seem to matter. After all,

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[301] 23-4-1862, Ericsson to Seward, EPPA. See also Church, *Life of Ericsson*, 2: 5-6.

Ericsson was delighted to point out to the Assistant Secretary how "The English government are all adrift on the question of naval defence." Armstrong's latest gun test "only confirms what all the world knows, that England is now without a fleet."[302] Nothing sealed the case for coast defence monitor-ironclads more than the recent *Trent* Affair, Anglo-American tensions, and the threat of foreign intervention in the Civil War. As official committee reports came back to Congress in April 1862 the largely accepted wisdom was that "Good armor and upright dealing united are well calculated to make nations friends."[303] While the Northern States were becoming, "by the pressure of domestic rebellion, more able to take care of our interests at sea, with the aid of gunboats and steamers and a marine of armed cruisers and privateers, ever ready," England had "lowered her tone and altered her policy to conform to the changed relations which her navy bears to the rest of the world."[304]

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[302] 28-4-1862, Ericsson to Fox, FP.
[303] 23-4-1862, 37th Congress, 2nd Session, House of Representatives, Report No. 86, *Permanent Fortifications and Sea-Coast Defences*, 21. See also 8-4-1862, 37th Congress, 2nd Session, Senate, Executive Document No. 41, *Letter of the Secretary of War, Communicating the Report of Edwin F. Johnson, upon the Defences of Maine*; and 30-4-1862, Joseph G. Totten to Lincoln, "Defence of the Upper Lakes—Memorandum for the President", LP Totten boldly admitted, especially in the wake of the fall of New Orleans, that "It is not possible to prevent the passage of vessels into Lake Michigan by means of fortifications, however placed... As we see that fortifications cannot be so placed as to prevent this, resort must be had to floating means."
[304] 10-4-1862, *CG*, 1622.

III. Ericsson, the Navy, and control of the Union ironclad program

In response to Welles' request for assistance in nearly every aspect associated with Union turret-ironclads, coastal or (Western) river—and at the lowest possible price—Ericsson wrote "There cannot be the slightest objection to your ordering copies to be made and distributed of the plans and specifications which I have presented to the Department. No change whatever has been contemplated on my part for those plans and specifications."[305] If ever there was a chance for the Swedish-American inventor-engineer to "make a killing", this was it. Yet Ericsson seems to have been much more interested with fame than fortune. It was more important to him personally that he was proved—rather than paid—right in the face of years of official rejection and what he regarded as professional prejudice. The unforeseen circumstances of the American Civil War had completely changed the nature of this relationship, placing the "Individual" over "System", and the Navy rather at the mercy of a civilian inventor, let alone an engineer. Thus, magnanimity, if not patriotism, to the American Union was probably worth more to John Ericsson at this moment in his life than mere royalties.[306] When Stimers responded to Fox's concerns of the 23rd he had to agree "about the importance of time in getting out new vessels". No one else could promise—and deliver—ironclads meeting so many of the Union's urgent requirements than Captain Ericsson. Furthermore, Stimers was not

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[305] 22-4-1862, Welles to Ericsson, and 24-4-1862, Ericsson to Welles, EPPA. James B. Eads agreed with Ericsson that "$500 is a small enough fee for each boat under all the circumstances for your valuable invention, and [I] will cheerfully respond to any drafts you may make for the amount... I will only state that in starting the construction of six boats I am not so abundantly supplied with money as I hope to be after receiving something from the Govt. on account of them," 13-6-1862, James B. Eads to Ericsson, EPPA. See also 20-6-1862, Eads to Ericsson, EPLOC, where Eads remarks "I think with you that America is about to make all the world wonder. I am thankful for being born in this era." See also, 23-7-1862, Eads to Ericsson, and 28-7-1862, Ericsson to Eads, EPLOC

[306] Ericsson's biographer, William Conant Church, also noted the inventor-engineer's personal belief that science would eradicate warfare by making it too terrible to practice. See, for example, Ericsson's 19-5-1862 endorsement of the Raphael's repeating rifle to Secretary of War Stanton, which in his assessment formed "one of the many strides which mechanical science is now making to render war too destructive long to continue the disgrace of civilization. The true friend of human progress will support such inventions," EPLOC See also 28-6-1862, W. L. Barnes to Erastus Corning, WP "[Ericsson's] sympathies are hearty & warm with reference to our success as a government", Barnes wrote, "& failure in this respect would be regarded by him as a calamity that concerned the civilization of the world."

above admitting he found Ericsson's "new plans so superior to any thing I had expected, that it appears to me it will be better for the Government to depend mainly on him for some time to come, at least until the subject is fully and satisfactorily developed." The two navy professionals, one an engineer, the other a leading voice in the Department, recognized how to handle the nineteenth century's quintessential irascible genius.[307] The prospect of humbling England was also an irresistible part of the bargain, and that too probably drove Ericsson to dictate ironclad policy "for free" during this crucial interval more than demand his fair share of the actual price of an ironclad navy of predominantly his design. Besides, Ericsson was still pressing Fox and Welles for a squadron of huge ocean-going monitors, and Fox clearly shared the same preference which Ericsson wrote "came just in time to give proper direction to my labors":

> Armstrong's last boast also stimulates to exertions in the same direction. The national contest for supremacy is now inaugurated. Sir William may do his best, but we will make floating targets which he cannot demolish, and guns that will sink any thing that his country has yet out to sea.[308]

Generosity with his designs and patents now could mean greater opportunities for Ericsson in the near future. Over 120 engines were already in demand, "counting upwards of 10,000 written dimensions" which he was preparing to charge 5 percent. But "if you deem this too high", Ericsson informed Welles, "I beg that you will fix a lower rate." He would not charge for the use of the specifications he supplied. All he asked was compensation for the "actual cost of preparing the plans". "In the mean time any contractor who presents...me a contract duly ratified by the Department will at once be supplied with plans and full instructions."[309] The fact that Commodore Smith was pushing the Secretary for an armament upgrade of 9-inch to 11-inch Dahlgrens for the

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[307] 24-4-1862, Stimers to Fox, FP.
[308] 28-4-1862, Ericsson to Fox, EPLOC.
[309] 24-4-1862, Ericsson to Welles, EPPA.

broadsides of the *New Ironsides*—and was himself dependent on Ericsson for the carriage and slide designs to make it possible, might have added to Ericsson's extraordinary influence at this time.[310] These were solid practical factors affecting Union naval policy rather than 'public hysteria' or 'monitor fever' following the Battle of Hampton Roads.

Welles himself gently pushed for more. Could not Ericsson have the new monitor specifications photographed for faster distribution to contractors nationwide? Was it possible to increase the monitors' speed? Ericsson replied that utilizing photography was, surprisingly, not practical. "The plans I furnish are of that accurate and detailed character that they may at once be put into the engineer's hand. Engineers well know that obtaining such plans is in the present case equal to putting the work six months ahead." The speed of the Federal ironclads was a relative affair—and this of course meant their superiority to "the average rate of European war vessels". Because of the Union's overriding need to operate along its own coast, with ironclads therefore of comparatively light tonnage, Ericsson assured the Secretary of the Navy "we are building exactly what we most need." The new monitors' finer lines combined with a more moderate length would "admit of very rapid evolutions" while the "large class (the *Warrior* class) and the steam rams" could not "affect anything against our small turret vessels". In close combat it was better to turn quickly, to "present our stems to assailants", while the monitors were well designed to act as rams as well. A vessel that tried to ram a monitor would do more damage to itself. Ericsson was adamant, both in the suitability of his ironclads—and their purpose. "You will find on careful examination that there are no vessels yet produced in Europe that could sustain an encounter with the fleet of turret vessels now building under your orders."[311]

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[310] See 24-4-1862, Smith to Welles, RG 71, Entry 1, Vol. 74. The vessel was officially designated "New Ironsides" 10 May 1862, Welles to Smith, RG 71, Entry 5, Box 423.
[311] 28-4-1862, Ericsson to Welles, EPPA.

How to deal with this potential threat, however, was still "a difficult and delicate task", Smith privately relayed to Welles on 10 May; "to decide between the plans submitted, varying as they do in model and general character." Furthermore, "much delay" was experienced due to "the constant and indispensable office duties of the Bureau Members of the [Ironclad] Board." As Chairman, Smith expressed his own "opinion that vessels or Floating Batteries for harbor and coast defence, should first claim attention to protect our Ports from foreign or rebel aggression..." Most of the money appropriated by Congress for more ironclads should thus be allocated for this particular class; the rest invested in two large ocean-going types, one wooden-hulled, the other iron for experimental purposes. On the other hand, Smith was not convinced that turret ships should fully dominate the Union's ironclad program. "For obvious reasons," he maintained, "case-mated batteries affording more guns for broadside action than turrets, should also be tested." Monitors were "no doubt efficient for harbor defence," but in his estimation they were "not the safest or of the most approved plans for Ocean or coast-service." The original *Monitor*'s passage to Hampton Roads he offered as proof. It was therefore disturbing to him that the other Board members had disregarded their full responsibility "of expressing an opinion upon each case presented for consideration", and had in fact recommended "the adoption of but one of the plans presented, and that is nearly identical in form and appointments with the plan prepared and advertised for by the Bureau of Construction &c, except that the material of the vessel is to be of iron." The Commodore also promised that his comments in the forthcoming report on the various proposals would be brief, finding it irresistible to add that they "should not, perhaps, be entitled to the weight due those expressed by other members of the Board who are presumed to be experts in the matters treated of."[312]

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[312] 10-5-1862, Smith to Welles, WP; also RG 45, Letters Rec'd and RG 71, Entry 1.

As such, the Ironclad Board's report three days later was again prepared to call out Ericsson's low freeboard, single turret, single screw, laminated turret ship ideal against that of the Bureau of Ship Construction & Repair, "the thick plated iron-clad wooden vessel of the usual form, with two revolving towers, and two propellers, of which the complete printed specifications of hull, plating, towers and machinery, accompanied by photographic working drawings—prepared by order of the Department—have been for long time widely circulated." There was more than a hint of resentment present. All of the submissions made seemed mere modifications, the Board stated, of these two types which "seem thus far to cover the entire field on this subject and...whatever may originally have been a matter of opinion as to relative merits an actual experiment with the *Monitor* has given a result satisfactory to the Department." No one had solved the problem of combining the best qualities of an ironclad with a cruiser. Wooden steamships would "still be found useful, especially in times of general peace for the protection of commerce in distant seas, and for war purposes against half civilized or barbarian nations, and others not having the means of obtaining armored vessels." It might therefore "be sound economy" to follow the British example and apply iron plating to some of the larger steam frigates, which alone could "carry iron plates of the thickness required to resist the artillery now in use." The Department's experimental refitting of the *Roanoke* would "determine the question of the practicability and economy of the conversion of vessels of this class."[313] If the *Roanoke* proved a success, the Navy might invest more of its resources into wooden-hulled, seagoing conversions, but seasoned white oak and yellow pine were in short supply, both for the government and private industry. To avoid the wastes associated with building warships with green timber, only iron-hulled ventures ought to be considered in future, while "Only the most pressing necessity can justify constructions from such materials, and in the event of less time being required." Laminated armour plate schemes were also to be considered "a make

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[313] *Ibid.*

shift justified by the impossibility of obtaining solid plates in the time allowed." What the Board was looking for was an iron-hulled, twin-screwed, double-turreted ironclad, with "rudder, screws, and anchor...protected by overhanging portions of the hull, the deck of which need not exceed two feet above the water level": a monitor. Of all the proposals recently submitted, that of G. W. Quintard's Morgan Iron Works of New York City met these preferred qualities the most.[314] This would become the U.S. Navy's first twin-turret monitor-ironclad, the *Onondaga*.[315]

Perhaps most importantly, the Ironclad Board was determined not to forfeit all control over Union ironclad policy and construction to private inventors and firms. The Department would begin designing a new class of double-turreted monitor-type ironclads for harbour defence which would "best suit its purposes".[316] Relying upon departmental plans—and control over "distribution of resources" among other factors—would insure greater uniformity in designs to various contractors, avoid confusion, and keep down costs.[317] Furthermore, the Board was adverse to any designs for ocean-going ironclads. "The cost of such vessels is so enormous, and the interests to be confided to their protection are so great that the most mature consideration should precede the adoption of any design or system of construction." Though this in itself implied a experimental process which could take years, similar perhaps to great efforts underway in Europe, the "most judicious course" for the Union ironclad program would be "for the Department to have plans and specifications prepared by a Board of Naval Officers, with which might

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[314] *Ibid.*

[315] See also Donald L. Canney, *The Ironclads*, 62-4. Canney states the *Onondaga*'s designer "eliminated the Ericsson monitor overhang and the excessive armor shelf, or hip, of those vessel", though the ship model photograph and ship's plans to which he refers clearly show an overhanging upper shelf over the stern, protecting the rudder and screws.

[316] 13-5-1862, Ironclad Board to Welles, RG 45, Letters Rec'd. These would become the four double-turreted monitors of the *Monadnock*-class, and then the even larger double-turreted class of four *Kalamazoo* ocean-monitors—all of which incorporated wooden hulls, however.

[317] *Scientific American* found this premise objectionable. "A very general opinion prevails in the community that it costs the government more to build steamers in the national navy yards than to obtain them from private builders. And it is believed by many persons...that any kind of iron work for war vessels, may be furnished by several manufacturers of angle iron, shafting and rolled plates, at less cost than such work can ever be made at any national navy yard," 28-6-1862, *Scientific American*, 404.

be associated, if the Department deems necessary, other persons of reputation and experience in the building of iron vessels, and upon such plans and specifications advantageous offers to construct will be proposed by contractors in competition on equal terms."[318] Ericsson's role would thus become that of an "associate"; possibly, but unlikely.

Stimers himself thought Fox's choice of Ericsson's "great ocean steamer" over "Harbor defence vessels to go twelve knots an hour" a mistake—until he saw Ericsson's finished, though preliminary specifications. "That vessel will astonish the world fully as much as the *Monitor* did", he wrote to Fox. Again, Ericsson's sublime ambitions combined with his very obvious ability to carry them out "converted" another sceptical "disbeliever", even one as closely affiliated as Stimers, who continued, "Now if we can build this vessel and send her to sea without having any description of her published and let her make her first appearance in an English port, it would absolutely frighten them, with no boasting account having preceded her, to have a Yankee ship come right into their port, which the merest inspection would show was impregnable to Sir William Armstrong's experimental achievements; would do more to keep Mr. Bull on his good behaviour toward us than any one thing it is possible to do."[319] Ericsson, Fox and Stimers constituted a triumvirate, with the usurpation of British naval supremacy its stated goal.

But would Gideon Welles join in too? Ericsson's cursory designs were for a par deluxe-monitor with a single, 30-foot outside diameter turret, which he promised to build for the Secretary "within nine months from the date of receiving your orders to proceed, for...$1,150,000." It would be the fastest war vessel afloat. Side armour would consist of six layers of 1-inch iron plate, backed by 4½-inch thick iron stringers and 3'9" of

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[318] 13-5-1862, Ironclad Board to Welles, RG 45, Letters Rec'd.
[319] 18-5-1862, Stimers to Fox, FP.

wood. The turret itself would consist of 10-inch deep rolled-iron bars sandwiched between layers of 1-inch plates, making a total thickness of 24-inches. Thus, "The balls from the powerful new Armstrong gun will prove harmless against this impenetrable mass of wrought iron." The description of guns, however, was ambiguous. They would not be 20-inch Dahlgrens but "constructed of wrought iron" and "warranted to stand twice the charge and carry three times the weight of ball compared with the boasted English gun."[320] Even as a ram "she will be far more formidable than anything that Europe has yet produced." Ericsson calculated that moving at 17 knots his monitor would inflict a staggering 32 million pounds of force "acting through a space of one foot"—and pointed, significantly, across the Atlantic.[321] Despite the fantastical qualities of Ericsson's proposed super-monitor one thing was certain: this was high-pressure salesmanship at work.

Yet Fox could only guarantee Ericsson that his plan would be "immediately considered". "It seems a powerful vessel," he wrote, "worthy of your brains." The Assistant Secretary wanted four, perhaps for a round million dollars per ship. Did Ericsson believe they could be built simultaneously, "two at New York, one at Boston, and one at Philadelphia"? At any rate, Fox would now officially cancel the order for the overlarge, cast iron 20-inch gun.[322] Remarkably, on the same day, 21 May, Commodore Smith expressed to Welles his whole-hearted disapproval of a rival proposal for an ocean-going turret ship, mounting 20-inch guns, from "Messrs. Pervil and Howes". The turrets were too large, "and the 20 inch guns too big for working at sea, even if they can be made, which, under the present system of casting, I consider impracticable." Laminated armour

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[320] 19-5-1862, Ericsson to Welles, EPPA. Ericsson explained his thoughts to Fox the same day in more detail: "a 16 inch ball (weight 550 lbs.) will produce the greatest effect possible... As a small ball can be propelled at a greater speed than a large one, the practical question is simply: what size ball will produce a hole or rent so large that it cannot be stopped during action? Whatever that size be, there let us stop, and then go for the greatest possible initial velocity," 19-5-1862, Ericsson to Fox, FP.

[321] 19-5-1862, Ericsson to Welles, EPPA.

[322] 21-5-1862, Fox to Ericsson, EPLOC See also 21-5-1862, Welles to Harwood, RG 74, Entry 16, Box 4.

he also objected to, and the "gun deck will be too near the water, it should be at least six feet above the line of flotation." This assessment did not bode well for Ericsson's own version, which Welles on the same day instructed Smith, John Lenthall, and Benjamin Isherwood to evaluate.[323] Worse still, Ericsson responded to Fox's inquiries that the cost of his super-monitor was simply beyond negotiation given practical engineering requirements. technical terms. Concurrently building four would not decrease their price (or completion time) but possibly the opposite, given the competition over limited labour and resources.[324] Perhaps not surprisingly, Fox informed prominent Boston shipbuilder Robert B. Forbes soon after the Department had "given out about a dozen harbor defense craft" and needed "a class of vessels to go out and meet the enemy, not to receive him in our harbors." To date, Fox was still fishing around, and open to suggestions. "We have not a single proposition for a cruising vessel and most of the sea steamers proposed must probably hover on the coast."[325]

As could also be expected, Smith's first impression of Ericsson's new monitor-ironclad was not favourable. To the Bureau Chief it was nothing more than a proportionately larger version of the original, and obviously therefore "well adapted for harbor defence, but not calculated for Ocean service." As such, many of the objections he made of the original were revived, especially the upper hull overhang. For harbours would it not be better to construct for the same price "three batteries", "each bearing guns and iron armature equal to this, though with less speed"? Yet, the Commodore noted to Welles, "We have already under contract ten vessel of the class of the *Monitor* of increased size and dimensions, besides nine others with the *Monitor* Turret for river service." Relying

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[323] 21-5-1862, Smith to Welles, RG 45, Letters Rec'd; 21-5-1862, Welles to Smith, Lenthall and Isherwood, RG 45, Entry 13.
[324] 22-5-1862, Ericsson to Fox, EPLOC
[325] 30-5-1862, Fox to Robert B. Forbes, FP. Forbes was the "Principal Inspector" for gunboats building in Massachusetts and Maine", assisted by Samuel Pook; see 10-7-1862, "List of Principal and Assistant Inspectors appointed by the Secretary of the Navy to Superintend the Construction of Gun Boats under Contract", addressed to Gregory, RG 19, Entry 1235.

upon new ordnance without a lengthy and meticulous series of tests Smith also objected to.[326] The entire principle, in fact, of a sea-going monitor was incongruous to the same U.S. naval professional who supervised the already historic *Monitor*'s construction.[327]

At this point it seems Ericsson's confidence in the full acceptance of his ideas wavered. "I learn, not without regret," he wrote to Fox, "that my plans of the large turret ship are being 'thoroughly examined and will be reported upon' ". These were "but a sketch intended as a basis for a contract." Whatever the "Engineer in Chief", his Bureau Chief rival, Benjamin Isherwood might report, Ericsson assumed he could "consider it as an instruction conveying the wishes of the Department rather than a criticism on my plan and proposition." If the Department wanted more details he could easily supply them.[328] First, were they intrigued by the ship's *potential*? Did they trust Ericsson, as they finally did in the autumn of 1861 with the original *Monitor*? Did they trust him any more, or less, since the Battle of Hampton Roads?

Already he was willing to give in on the idea of twin-turrets, "for two of the proposed four vessels", as much as "the ship can sustain." Smaller guns and improved armour-plate manufacture might indeed facilitate such an option. For less than $100,000 Ericsson was willing to provide the former, of 15- or 16-inch calibre, and promising they would "mark an era in the history of artillery and naval warfare." Isherwood's preliminary memo on the super-monitor's speed, however (which Fox had forwarded), Ericsson could not "refrain from recording [his] dissent".[329] Stimers' own calculations tended to favour Ericsson's. All other mechanical and structural factors for the proposed

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[326] 23-5-1862, Smith to Welles, RG 45, Letters Rec'd.

[327] Smith went so far as to "perceive no advantages which the Turret affords over a case-mate". To him, the advantage of rotating the guns was more than offset by the disadvantage that "the guns could not be fired on both sides at the same time, which is often important," 3-6-1862, Smith to Welles, RG 45, Letters Rec'd. By the end of 1864, he had not changed his mind, writing Dahlgren "I fear the Ericsson big ships will prove a failure but I hope not. I am right on the record in regard to them," 1-12-1864, Smith to Dahlgren, DP

[328] 6-6-1862, Ericsson to Fox, FP.

[329] *Ibid.*

vessel being fixed, the grate surface of the boilers was, in the Chief Engineer's experience, where "the shoe always pinches when we are trying to make our ship go fast and I find in this instance that he [Ericsson] has been (as engineers usually are) more liberal with his engine power than he has in the extent of his fire." Furthermore, while "one admires the talents of Isherwood more than I do," Stimers ventured his opinion to Fox, "but if you will examine his professional writings during the past twelve years, you will perceive that for some reason he is greatly prejudiced against Ericsson. Commodore Smith will tell you the speed he predicted for the *Monitor*."[330]

The Assistant Secretary, for his part, could only relay to Ericsson "If you and Isherwood differ with regard to the grate surface, other engineers had better look over the figures. All I ask is to be convinced that 16 knots can be obtained the first day." There was no need for his prize-inventor to take alarm. "Whatever responsibility attaches to the recommendation of the plan I assume." Double-checking Ericsson's figures, however rough they were, was "of course very necessary before making the large contract that I desire."[331] Concessions worked both ways, for Ericsson could not refuse to consider the thicker hull plate, more solid-plated turret armour and different boilers which Fox (and Stimers) desired if he wanted the 'large contract' too.[332] Whether or not this sort of compromise was best was another matter; giving ground to get approval, Ericsson might critically disfigure his original specifications with outside suggestions and modifications better than his own in some cases, worse in others. In any case, Stimers tried to reinsure his mentor "You will not be interfered with in your arrangements. The Secretary and Mr. Fox have the greatest confidence in you skill and uprightness..." But Ericsson had to keep in mind the extraordinary demands he was placing on them, for Stimers considered

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[330] 6-6-1862, Stimers to Fox, FP.
[331] 9-6-1862, Fox to Ericsson, FP.
[332] See 6-6-1862, Fox to Ericsson, FP.

"they take as much responsibility as could be expected from them when they decide in favor of your plans *in direct opposition* to the views of the Bureau officers."[333]

This opposition arrived the following day in the form of Lenthall and Isherwood's report to Welles on Ericsson's ocean-going monitor proposal—which had virtually become a referendum on who should direct the Union's ironclad program. According to their calculations, Ericsson's ship would draw 19 feet 5 inches, with 2 feet 7 inches above the waterline amidships and her extremities only "just awash." Perhaps more damaging, the Bureau chiefs estimated the ship's material value at $883,000, "which by adding five (5) per centum for omissions" became $927,000—over $220,000 less than Ericsson's asking price. Comparing the dimensions of the proposed ironclad with other (commercial) vessels, and her engines and boilers, "under the most favorable conditions and for short periods a maximum speed of 13¾ knots per hour may be attained." Burning 158 tons of coal every 25 hours, such a monitor could only carry fuel "sufficient for 6⅓ days consumption", thus hardly making her an oceanic steamer. The upper hull overhang inhibited greater speed and distance (though how they were able to make such a determination, especially if "based on the performance of coppered vessels of the usual form" is not mentioned.) Consequently, her draft prohibited her use for efficient harbour, if not coast, defence, yet the vessel had no masts and sails, relying upon engines that could offer little speed and strategic range.[334] Ericsson's super-monitor was all but worthless. This also said little for her actual seaworthiness, which Lenthall and Isherwood regarded "under all conditions of weather is extremely problematical: the small height of her deck above the water and the form and position of her projecting hips

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[333] 9-6-1862, Stimers to Ericsson, Church, *Life of Ericsson*, 2: 8-9.

[334] Indeed, when the U.S.S. *Dictator* finally arrived at the Norfolk Navy Yard, in December of 1864, her commander, Commodore John Rodgers, wrote his wife: "We are all ready to move, but detained by the tide. There is not water enough for this vessel to go to Hampton Roads except at half tide." Likewise, there was "barely width in the Channel here to allow the vessel to swing by means of lines at both ends so as to pivot her in the middle of the channel," 6-12-1864, John to Anne Rodgers, RFP.

are opposed to the requirements of an efficient sea going vessel, if the past experience of most Seamen can be applied to vessels of this kind."[335]

Perhaps that was the point. Ericsson's naval and maritime technology was so radical that few, if anyone, could properly assess its likelihood of success. Truly, the Swedish-American inventor-engineer was taking the Union Navy off into uncharted waters. Hence, Ericsson's assertions that low-freeboard did not necessarily imply a lack of seaworthiness could be counterbalanced by Lenthall and Isherwood's equally-convincing arguments that semi-submersion acted as a drag upon the projected speed of monitors at sea. Furthermore, it seemed logical that "rafts" were more vulnerable to ramming than higher-freeboard warships; and who could say whether turret guns could be operated in open seas? Ericsson's recent conceded preference for thicker plates for the side hull armour only coincided "with the views we have given on this subject on several occasions" (and could thus be turned against him.)[336] What did this imply for Ericsson's credibility?

In a draft of a letter to Fox, dated 11 June 1862, Ericsson stated his intention to "meet your wishes" to "greatly reduce the proportion of the armor timbers at the bow, in other regards, the length of the ram". Apparently this alteration "came just in time—to a day almost." The "manner in which the said overhang is now being secured is such that the entire weight of the ship would not have power enough to endanger the security of the junction." In other words, the super-monitor would not feature an overhang at the bow.[337] Fox also wanted Ericsson to "try and make the bottom of the big ships [13-16ths of an inch thick] and the frames in proportion, and the grate and heating surface as expressed in my note." These modifications too would radically affect the ironclad's

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[335] 10-6-1862, Lenthall and Isherwood to Welles, RG 19, Entry 50.
[336] *Ibid.*
[337] See also Church, *Life of Ericsson*, 2: 10-11.

weight, but Fox still encouraged Ericsson to write "an official letter to the Secretary of the Navy, proposing to build four vessels of the speed of 16 knots and according to other points herein talked of. Two of one turret each, and two of two turrets each...The Secretary will answer your proposition at once."[338] It was not exactly what Ericsson wanted, but Fox would continue to allow him to argue his case to Welles, in direct opposition to the Bureau chiefs. Assuming Ericsson was willing to bend to his (and to some extent, the Bureau chiefs') wishes, the Assistant Secretary would also continue to personally advocate Ericsson's plans. This way Ericsson would get his contracts, and the Department would get more of the *type* of ironclad it preferred.

Five days later Fox wrote to Ericsson, "The [Secretary] has to day decided to let you build two vessels of the big class—one of 1 turret and 1 of two turrets." He was sorry that an entire squadron had not been approved, the original dream, 'but if no new plans are presented within a few months," he promised, "it may be considered by him desirable to build two more."[339] Clearly, the Union Navy was not about to go as far with him as Ericsson wanted. There was still—and likely there would always be—enough opposition to prevent a technological overhaul so radical in nature, with such a sweeping professional reliance upon one man. Even the extraordinary and tumultuous circumstances of the American Civil War—especially the overriding threat of war with the British Empire—could not justify giving Ericsson such *carte blanche* control.

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[338] 13-6-1862, Fox to Ericsson, EPLOC.

[339] 18-6-1862, Fox to Ericsson, EPPA. The official letter of approval from Welles is dated 23-6-1862, and bears the influence of Lenthall and Isherwood, who crucially specify "The beams of the vessel with two turrets to be of wrought iron," WP.

Summary:

The grandiose magnitude of this objective all but eclipsed that of subduing the South—though not that of overpowering any future ironclads crudely fashioned by the South. Indeed, wiping out the threat of the converted Virginia *and her rough-and-ready sisters would by a logical side effect of the investment in monitors which could handle the more formidable ironclads building in Europe (rather than vice-versa). At any rate, the spring of 1862 saw the Union in an excellent position, it seemed, to end the war within months. New Orleans was captured, Vicksburg was next (thereby completing Union control of the Mississippi River and cutting the South in two), and the Army of the Potomac was closing in on the Confederate capital of Richmond. The events at Hampton Roads meanwhile served to give Britain pause, as well as insure the survival of the Union blockade. A single Confederate ironclad had suddenly upset the balance of power; a single Union one restored it. Another obvious lesson was the need for singularly heavy guns to smash iron more than wood.*

It was this growing obsession for maximum concentration of force—to undo the outcome of the Trent *Affair—which again favoured John Ericsson's schemes over that of the Navy Bureaus. Lenthall and Isherwood could only respond that the United States had to confront British naval supremacy on similar terms. Instead of consolidating the technological powers of individual warships, the power of the Federal government itself over national technologies—in iron shipbuilding, armour manufacture, engine-production and gun-making—should be consolidated to produce a wide-ranging, first-class ironclad navy second to none. This said little for the actual design of the ironclads themselves, basing their innate superiority more, as was the Royal Navy, upon incremental increases of armour thickness, firepower and overall numbers of such warships; a supremacy of mass production in the modern Industrial Age between rival*

national resources, one continental-based, the other maritime. It also ignored the circumstances *of the United States at the time, desperately fighting as it was for a continent under one government.*

Aside from the pervasive threat of a war with Great Britain, which Ericsson and Fox exploited to the fullest, the enormous popularity of the Monitor *after her duel with the* Virginia *paradoxically risked the military alienation of her civilian inventor. The press and Congress both proved willing to twist Hampton Roads as a means of challenging the authority of the Navy, if not also the White House, in a variety of competing political agendas. Only the close working relationship and personal trust between Fox, Ericsson and Stimers managed to preserve the monitor system, though Ericsson was never able to secure the total faith he expected from others in his radical vision of the Union's ironclad program. Nor was he free to concentrate his own formidable talents and energies upon the lone* Dictator. *Unparalleled personal success brought Ericsson equally unparalleled responsibilities, and these would only intensify as the fortunes of the American Civil War changed yet again.*

IV. British reactions to Hampton Roads and the '*Monitor* Riddle'

What an ironclad duel might actually involve for the British following the *Trent* Affair at the end of 1861 was demonstrated soon enough, when the Union *Monitor* confronted the Confederate *Virginia* at Hampton Roads in early 1862. More dramatic for British interests, perhaps, was the one-sided engagement between the heavy sloop U.S.S. *Cumberland* and the frigate U.S.S. *Congress* against the *Virginia* the previous day. In a letter to "The Peace Society" (which it frequently ridiculed) *Punch* rejoiced in "imagining the havoc which one *Warrior* would create amongst a whole fleet of timber vessels crowded with invaders," though with ironclads "there really does seem some ground for hoping that, ships being rendered practically invulnerable, any two vessels of war belonging to hostile nations, will, hereafter, meeting on the high seas, each find herself unable to injure the other, and therefore be obliged to part in peace..."[340] The London *Times* likewise commented on the obvious "efficiency of a single iron-cased frigate against any number of wooden vessels," adding however "the fact that nine-tenths of the British Navy have been rendered comparatively useless":

> Now, suppose these two vessels had encountered a division of the magnificent fleet under Admiral Milne; what would have been the result? Would our Ariadnes or Orlandos have fared any better than the Cumberland and Congress against an invulnerable enemy? True, they might have availed themselves of their speed and escaped destruction; but if they had chosen, as they, no doubt, would have done, to fight, what would have been the end of the battle?[341]

The *Illustrated London News* meanwhile depicted "The Naval Revolution" on its cover page of 5 April with the "Merrimac" spectacularly ramming the *Cumberland.* But whereas the *Times*, in its relentless campaign of anti-U.S. sarcasm, wrote that "the

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[340] 5-4-1862, *Punch*, 134.
[341] 1-4-1862, London *Times*.

Warrior and her escorts" would have expressed "our naval supremacy...as decidedly, though more compendiously than ever" against "turreted Monitors", the *I.L.N.* was "not sure, indeed, that the case is not worse than the *Times* believes":

> Is the Warrior itself a match for the Monitor? It is useless now to talk of speed and magnificence. We don't want our war ships to run away successfully, or to be looked at admiringly, but to fight. How would the Monitor deal with the Warrior? The guns of the first send shot of 170lb.; the guns of the second, shots of 100lb...Again, the Monitor is practically invulnerable to existing artillery: is the Warrior the same?[342]

What should England do? The "Revolution" of Hampton Roads suggested that the Royal Navy's ironclads could indeed prove decisive against an enemy's wooden fleet—whether on the defence or the attack—but the same applied to British wooden ships constituting the bulk of Britain's naval force in early 1862 against even the hastily-built ironclads of a resourceful potential antagonist. An Admiralty memo on the "Royal Navy Classification of Ships", dated 17 March 1862, fine-tuned its definition of sloops and gun-vessels but conspicuously did not mention ironclad warships at all, revealing perhaps the still "experimental" status they carried.[343] News of the American action at Hampton Roads, combined with the growing doubts of exactly how a war against the Northern States could be prosecuted successfully,[344] forced an end to this. Furthermore, the actual type and *character* of ironclads themselves was suddenly a public as well as professional topic of concern. The radically-opposed designs of the Americans, North and South—the slanted-casemate *Virginia* and the raft-like, turreted *Monitor*—could now be contrasted with the concept of a fully-rigged armoured frigate. Imperial Britain's "national" security and its ability to extend or project its naval power beyond its own coasts was no longer as

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[342] *Ibid.* 5-4-1862, *Illustrated London News*, 328.
[343] ADM 1/5802, 17-3-1862. See also Hamilton, *Anglo-French Naval Rivalry*, 89-92.
[344] See for example, 11-3-1862, Newcastle to Somerset, SP.

straightforward or traditional a question as it was against Vera Cruz. Bold new technological challenges required equally bold responses, but which ones?

For the *I.L.N.* the answer began with treating "Captain Coles as our cousins are treating Captain Ericsson—that is, put the right man into the right place, and give him hearty support when there." Britain was now "entering a race in which success will no longer be achieved by wealth or material resources, under merely ordinary conditions of skilful development," since "men of inventive genius", men of "skill, science and individual energy" were clearly able to devise and produce high-tech weapons systems which might abruptly change the face of naval warfare, and more.[345] Somehow, in little more than three months, the Yankees seemed to have reversed the entire strategic balance enjoyed by Great Britain during the *Trent* Affair—stealing a march in ironclad design as well. Uncomfortable about its affects on already strained Anglo-American relations, Russell hoped Palmerston would "stir up the slow and steady Admiralty to some vigour about Iron Ships":

> The French have long been before us and in six months the United States will be far ahead of us unless our builders in the Navy Department exert themselves.
>
> I would willingly pay the additional per centage on assessed taxes which [William E.] Gladstone suggested if to was to give us at least some acceleration of our iron ship building.
>
> Only think of our position if in case of the Yankees turning upon us they should by means of iron ships they should renew the triumphs they achieved in 1812-13 by means of superior size and weight of metal.[346]

It was therefore obvious to the *I.L.N.* that the expensive land-based fortifications insisted upon by Palmerston's government should be at least temporarily suspended, while

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[345] 5-4-1862, *Illustrated London News*, 328.
[346] 31-3-1862, Russell to Palmerston, PP.

existing wooden steam-powered warships should be cut down and re-fitted as 'cupola vessels'. In addition to the vulnerability of wooden ships against ironclads, and the shape and function of ironclads themselves, the sensational American ironclad duel thus constituted a third serious challenge to Britain's existing—and proposed—defences. A timely letter from Coles led the attack on Monday, 31 March in the *Times*. Although the "various experiments upon every sort of iron-clad targets, sections of ships, sections of forts, even old floating batteries, and, lastly, with shields or revolving towers on them" were very judicious and valuable, "the one on the other side of the water that has taken place in the natural course of events is of more value than all" since it solved the question of "how are we in future to protect our harbours from iron marauders and our dockyards from being destroyed?" Some 20 "of our screw and now useless line of battle ships could now be converted into most efficient iron blockships"—coast defence "shield ships" of Coles' design, which he vowed would be much cheaper and constructed more rapidly than forts or *Warrior*-type ironclads, and yet be deadlier against invading (broadside) ironclads than either.[347]

Acceptance of these more radical ironclad concepts exemplified by private inventors like Coles and Ericsson, British and American, tapped into the latent Victorian romantic imagery on both sides of the Atlantic of the "misunderstood genius" or individual-hero whose vision alone could save his country from immediate peril—or at least a loss of prestige.[348] "Let it not be said by history, as it has already been suggested in Parliament," the *I.L.N.* therefore concluded, "it is harder to work a conversion in our Government than among our ships."[349] Any discussion, any debate, over individual classes of ironclads was set to be one over individuals themselves—a war of wills. Hence Ericsson's endless

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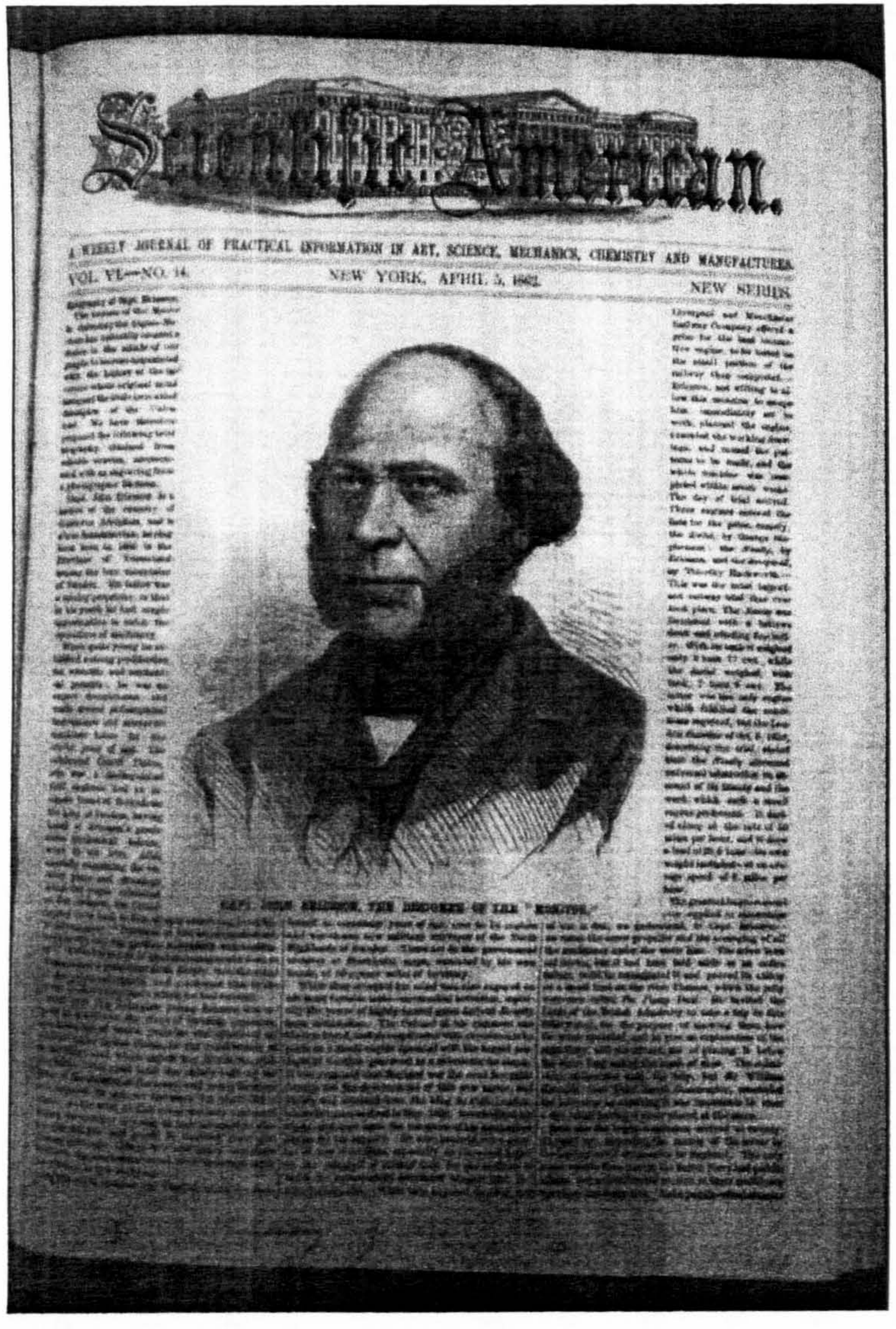
[347] 31-3-1862, London *Times*.
[348] See for example David A. Mindell, *War, Technology, and Experience aboard the U.S.S.* Monitor (Baltimore: John Hopkins University Press, 2000).
[349] 5-4-1862, *Illustrated London News*, 328.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CAPT. JOHN ERICSSON, THE ENGINEER OF THE "MONITOR."

Before the Battle of Hampton Roads, Ericsson was well-known, but not "popular"; Coles by comparison was neither, but news of the success of Ericsson's engineering triumph, the U.S.S. *Monitor*, seemed to promise the same for him. In both cases, the sudden fame had its price, namely alienating official public servants in both navies, political manipulation, and spotlight pressure for results.


SUPPLEMENT, APRIL 19, 1862.] THE ILLUSTRATED LONDON NEWS 399

CAPT. COWPER PHIPPS COLES, R.N.

Captain Coles, of whose services as inventor the Admiralty has been forced into a sudden acknowledgment, is descended from a naval family on the side of his mother as well as that of his father. He is the third son of the Rev. John Coles, of Dunkeat Park, Rector of Stoke-by-Nayland, by his first wife, a daughter of a naval Captain, [illegible] of Ships' [illegible] Lord [illegible], G.C.B. Having entered the Navy in December, 1811, he served for three years under Lord Exmouth as first-class volunteer and midshipman in the Mediterranean. He witnessed Sir Julian Pauker's bombardment of St. Jean d'Acre, during the insurrection in August, 1840, and in October following was appointed Aide of the Glasgow, 84, under Captain Bailey Hernandez. During the expenditure in 1840-41 on the coast of Syria, Mr. Coles landed as commander of a Sidonian. After various service and some hardship, of which the delicate look and frame still bear evidence, he was appointed senior Aide of Sir Wm. Parker's flagship the Hibernia, 104, on Jan. 7, 1846. Soon after this he received his Lieutenant's commission. He twice served on board the Sir Francis Drake under Sir Charles Napier; and, in March, 1850, became senior of the Sybille under Captain (the Hon. Keppel Craven) Fitzroy, and sailed for Trincomalee. On his arrival there, finding he had been promoted First Lieutenant of his old Captain, then Rear-Admiral Lyons, he resigned in consequence, and returned, on the Admiralty's expressing surprise, the Admiralty's appointment in the Black Sea, the command of Queen, married to removing the wreck of Hogarth's Church, and the Arms of the Clothworkers' Hall, &c., and took part in October, 1854, in the attack on the gun-boats of Schumla. There Lieutenant Coles displayed conspicuous gallantry, and his gallantry was noticed in gallantry terms by the Admiral Lyons. When the Armistice and Sebastopol were taken, and nearly passed under the fire of Fort Constantine, Coles, on board the Sir Francis Drake, came to the Lord George Paulet, and, while the Admiral [illegible] really believe that he was the means of saving the [illegible]. His conduct was characterised by the Commander-in-Chief as "an act of devotion and courage rarely exceeded"; but this act failed to obtain for him the Victoria Cross, to which he was fully entitled. Admiral Lyons, however, presented him with the Commander's commission sent home to the latter from the Admiralty.

In January, 1856, he was appointed Second Captain of the Rodney, 92, and to May following was with the Baltic fleet. In 1857 he joined the Arrogant, 46, for the expedition to Kinburn, and served the war of Asoff with the fleet under Captain Edmund Lyons. In addition to commanding in the destruction of stores, he was engaged in the attack of an Army and a Battery, mounting six guns, on the spit of Arabat, covering the [illegible], which occasion the Admiral [illegible]. He assisted in forming a new channel at Kinburn

CAPTAIN COWPER PHIPPS COLES, R.N.

port upon Captain Coles's method and plans for the construction of shot-proof rafts, guns, and mortars. So favourable was this report, for which Captain Coles had prepared drawings and models, that, in expectation of the war continuing, he was ordered home, and put into communication with the dockyard authorities at Portsmouth and the Surveyor of the Navy. The cessation of hostilities prevented further proceedings.

Captain Coles was advanced to his present rank in February, 1856, since which time he has been on half-pay. He is a Knight of the Legion of Honour, and has received the Sardinian, Crimean (Sebastopol and Azoff) clasps, and Turkish medals. He married, in 1846, the daughter of H. S. Pearson, Esq. It is not too much to say that a careful examination of the plans of the Monitor and Merrimac will prove that whatever they have merritorious in either has been suggested by Captain Coles's writings, pamphlets, and plans, which he has from time to time published. His last pamphlet on shot-proof gun-shields, being the report of a lecture delivered in June, 1860, at the United Service Institution, in which has plainly been consulted by the authorities of the New York Navy-yard in the construction of the Monitor. On pages 4 and 5 of this pamphlet two woodcuts (figs. 3 and 4) represent two guns placed under a cone-formed shield, the horizontal motion "or training being effected by turning the shield itself with the gun, rear, and platform on which they stand." It will, perhaps, therefore, be as well if Captain Ericsson and his friends yield to the inventor the merit he deserves; and, had our own authorities been wise enough to have seen the advantage of Captain Coles's invention a year or so earlier, the country might have been saved the unique expenditure of millions sterling.

THE PLAN OF CAPTAIN COLES FOR RECONSTRUCTING THE NAVY.

It is a fortunate peculiarity that England never yet has wanted the right man at the right time. "Wanted us," cries a poet, "but our England want for men?" And at this precise juncture, whilst the rest of the world stands aghast at the sight of a tournament of iron-clad ships; when the masters of the deep, like the knights at Ashby-de-la-Zouche, were armour; when three-decker and 100-gun ships are out of date, and the heart of oak is useless against mammoth projectiles and destruction-dealing shells, we are indeed fortunate in finding in Sir William Armstrong an inventor whose guns and projectiles exceed 40 calibers, and in Captain Coles one who has devoted no large a portion of his life to the study of armour-clad vessels that he has established all that the most vaunting inventors of America or France can bring against us.

As the eye is caught by a diagram more quickly than the mind is reached by a description, we shall leave the

personal struggles against Lenthall and Isherwood of the U.S. Navy Bureaus for commanding influence in the Union's ironclad program; and Coles' even more publicised challenges against Robinson the Controller and Reed the soon-to-be new Chief Constructor of the Royal Navy.

As was to be expected, the anxieties of the British press quickly extended to the Houses of Parliament. The same day Coles' proposed solution to the riddle of the *Monitor*'s implications for Imperial Britain was virtually broadcast in the *Times*, Sir Frederic Smith noted in the Commons that the "great question of iron-plated ships against wooden vessels had been brought to an issue," adding suggestively "happily, without any action on our part." While he was formerly willing to accept the proposed massive island-towers at Spithead, guarding the approaches to Portsmouth (objecting on the other hand to the ring of landward-facing forts designed to hold off a besieging army), the recent spectacle of ironclad steamers impervious to even close-range heavy cannon fire changed this. Armoured batteries—which incidentally carried "both heavier guns and much more impenetrable armour plating than any sea-going vessel"—could both run the gauntlet of forts and protect commercial ports and naval dockyards more effectively than fixed defences. Another member added that "if the *Warrior* had met the *Merrimac*, it was a matter of grave doubt whether the angular-sided vessel would not have overcome her vertical-sided antagonist; but if the *Warrior* and the *Monitor* had met, there was little doubt that the smaller vessel would have plunged her shot into the unprotected parts of the *Warrior*, and would, in fact, have overcome the pride of the British navy."[350]

In response, Sir George Lewis referred to the 1861 Report of the Defence Commission which concluded both fortifications and floating-batteries combined would be the best plan. Was the House therefore prepared to vote for "a Supplementary Estimate of some

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[350] 31-3-1862, *Hansard*, 263-72.

£10,000,000 or £15,000,000" for the latter? Noting even the Union Army's experimental Rodman guns, Lewis was confident ironclads would ultimately prove vulnerable to ever-heavier ordnance—itself always easier to mount and man on land. In this sense the greater cost associated with forts was still a safer investment to the Government than "to rush into a series of costly changes" associated with naval defences which technology was more prone to affect adversely.[351] John Bright, however, felt "the man must be particularly stupid who does not see the importance" of the latest events in America. The current question was "whether the batteries which we are about to erect at a vast cost in the neighbourhood of Portsmouth harbour capable of resting the entrance of iron-plated vessels, such as the *Monitor*"? For the moment no one could say yes, so the construction of such fortifications should be temporarily suspended and public money saved while his Birmingham constituents, at least, coped with the expected deprivations rising from the blockade of Southern cotton. *Punch* was pleasantly surprised to agree for once with Bright:

> If Sir George Lewis is going to play the Old Fogy, and resist all improvements, the sooner he retires to some sequestered spot, and studies his Greek authors without interruption by public affairs the better. Meantime we beg to remind the learned man, that neither the Pyrrhic [sic] phalanx nor Greek fire was invented by parties who declined to advance with the military spirit of the time. Will that consideration move him—or must *we* move him?[352]

Nor was the reply of Lord Paget, the Admiralty spokesman, that the navy generally accepted Coles' principle of "shield-ships", entirely satisfactory; for he also had to condemn along with the *Monitor* their relative lack of strategic range and

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[351] *Ibid*, 275-8.

[352] 12-4-1862, *Punch*, 143. Little did *Punch* know that the following day Lewis wrote to Somerset he was now "thinking of requesting the Defence Committee to report on the recent action in America, and to state whether it induces them to modify their opinion respecting the Forts at Spithead," 1-4-1862, Lewis to Somerset, SP.

seaworthiness.[353] Either the entire conception of British national and imperial defence was going to be upset by the American example, it seemed, or it was not.

For that matter, how radical were Britain's leaders truly prepared to be? Politically, there was little doubt that mid-Victorian society was basking in something of a Pax—or "Age of Equipoise"—under "Old Pam's" Whiggish yet undeniably conservative stewardship. Closely linked with this sense of social and even political security (since Palmerston's coalition government had indeed managed to keep the Liberals intact, the Tories content and the Radicals at bay) was the commonly expressed desire for potent military and naval symbols of national strength and defence. Anything else would be construed by the popular press as foolishness. Palmerston, the "Old Guard", would "slap" naïve Radicals such as Richard Cobden and Bright who believed peace could be maintained by anything other than fortress walls, or an Armstrong Gun.[354] Occasional "Panics" of rising continental armaments and intentions—the old suspicion of a French desire for revenge for Trafalgar and Waterloo—were fuelled upon a latent xenophobia, and classically stoked by politicians for a multitude of private or "public" reasons. In this sense, therefore, realism coincided more closely with conservatism on issues of defence.

Yet Britain's industrial and financial resources, though recognized as the most developed in the world, were not by any means limitless. Few speakers in Parliament would dare to suggest that it was not better to be safe than sorry, but many could appeal to equally prevalent Victorian values of thrift, efficiency, and progress. It was thus in early 1862 that Palmerston's nemesis, Cobden, argued for essentially strategic (naval) arms limitations-talks with France, to negotiate a mutual reduction in at least the now

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[353] 31-3-1862, *Hansard*, 285-6.
[354] Literally, see *Punch*, 3-5-1862, "Peace", and 19-7-1862, "The Old Sentinel".

THE OLD SENTINEL.
PAM. "Don't you meddle with things you don't understand, young feller."
From *Punch*, July 19, 1862

Just as there was a domestic/foreign dichotomy at work in Union naval strategy, mid-Victorian British society found itself torn between conflicting desires for peace; whether through strong national defences, or in spite of them. Coastal defence turret ironclads offered an alternative to fixed fortifications—but were ultimately rejected as tying down rather than freeing the Navy.

(Left, from Philip Guedalla, ed., *The Correspondence of Lord Palmerston with Mr. Gladstone 1851-1865*)

THE NATIONAL CRINOLINE.

MR. PUNCH "I TELL YOU WHAT IT IS, MARM, ALL YOUR GUARDS WON'T KEEP YOU OUT OF THE FIRE, UNLESS YOU REDUCE SOME OF THAT."

universally-recognised obsolescence of wooden ships-of-the-line.[355] Somerset, however, disagreed with Cobden's gloomy forecast of endless rival naval expenditures, even with the advent of iron and armoured ships which prevented "any exclusive advantage from the augmentation". Improved armaments would likely lead to improved economy. "In a few years it seems probable that, instead of a large fleet of two deckers at sea, we shall keep a smaller number of iron-plated frigates ready in our ports and harbours, from which one or two will occasionally go out for a cruise, but that the general duties of the navy will be performed by a smaller class of vessels such as corvettes sloops and gun-vessels." The current increase was due to the state of transition only, the First Lord argued. Indeed, it was his conviction that "our large naval force has not however incited us to war, but has been on the contrary instrumental in maintaining peace. Out hostile passions have not been inflamed, but on the contrary this country has shown a temper and forbearance which Mr. Cobden as well as every lover of peace must approve and admire."[356]

Of all other nations in the world it was the United States which many Englishmen were in the habit of pointing to; the "other" Victorian society, the English-speaking republic, that always seemed to move forward as fast, if not faster, than Britain herself. "The whole spirit of modern warfare," one Parliamentary critic declared, was now obviously one of "mobility against permanence."[357] As such, Somerset had to warn Palmerston the next day that "under present excitement the Government will be beat" on the issue of forts or floating batteries, especially since it was unclear "how far the Government is committed to the [fort] contractors and no statement on this point was made to the House of Commons."[358] Lewis wanted the First Lord to attend a meeting at the War Office on the 4th to discuss the issue of ironclads vs. fortifications.[359]

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[355] Undated, 1862, Cobden to Palmerston, PP.
[356] 11-1-1862, Somerset to Palmerston, PP.
[357] 4-4-1862, *Hansard*, 590.
[358] 1-4-1862, Somerset to Palmerston, PP.
[359] 3-4-1862, Lewis to Somerset, SP.

But before this chance for the Government to regroup Somerset was compelled to answer criticism in the House of Lords on 3 April. The Earl of Hardwicke referred to "the late events on the American coast and in the James River," which "had brought about a sort of crisis in the state of public opinion":

> ...it had evinced the world that in contest between iron and wooden vessels the latter were utterly valueless. It was, therefore, for the Government to consider whether they would any longer nibble at this matter, but whether they should not rather open their jaws wide and swallow the whole, let the cost be what it might, and persevere in the construction of an iron-plated navy. As the question now stood before the country, it was as much one of common sense as of science. The duty of a navy was to secure the coasts of the country inviolate, to protect the coasts and harbours of our colonies, to blockade the enemy in his own ports, and to supply an adequate number of cruising ships for service at home and abroad.[360]

As most of the Royal Navy was wooden, it therefore stood to reason that most of it could not deal with coastal defence ironclads. The same, however, applied to a potential adversary. Two types of vessels should comprise the navy of the future: mastless steam-powered turret-vessels like the *Monitor*, limited, however, by the fact that they "could not keep the sea long for want of coal"; and sail-and-steam ironclads of good speed which should at any rate be of smaller dimensions for greater manoeuvrability and lighter draft for general dockyard accommodation than the *Warrior*-class ironclads, since "in fighting ships it was necessary to combine the qualities of sea-going vessels with those of a man-of-war, and to abandon a portion of each for the sake of the whole."[361]

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[360] 3-4-1862, *Hansard*, 430-1.

[361] *Ibid.* See 7-8-1862, *Return: Navy Dockyards, Ordered 30-6-1862 and 15-7-1862, PPs.* The *Warrior*- and *Minotaur*-class ironclads could only be accommodated in three docks at "High Water Spring Tides": one at Portsmouth, one at Devonport, and one at Keyham. The *Prince Albert*-class of iron-hulled, coastal defence turret ship, by comparison, could be accommodated in at least twenty.

Somerset replied that the current Government, on taking power in the summer of 1859, was merely fulfilling the wishes of the House then and the previous Government to "possess a powerful fleet of line-of-battle ships, and that we should add to the strength of our naval reserve" in addition to laying down two experimental iron-cased steamers. Though the new First Lord apparently considered altering *Warrior*'s sister-ship, *Black Prince* (on what basis he did not say), he "found it would be necessary to have the whole details calculated over again and the lines re-drawn, which would have taken three or four months; and as there was a feeling throughout the country that it was desirable to proceed, I ordered her to be completed on the same lines as the *Warrior*":

> But I was not quite satisfied with those vessels. I admit, with the noble Earl, that great length and great draught of water, although characteristic of powerful vessels, and enabling them to make rapid passages, are also attended with inconveniences. I therefore caused the Department to reconsider the question, and to suggest plans for two vessels of a smaller class, which were accordingly prepared at the close of the autumn. Those two were *Defence* and *Resistance*.

Yet Somerset admitted he was also "not satisfied with these", since none of the first four ironclads, large and small, were "sufficiently protected". The *Valiant*-class was a third attempt to produce Hardwicke's well-balanced, armoured 'fighting ship'. All of the vessels were at the mercy of contractors, who "find more difficulties than they had calculated upon; so much time is required in forging enormous pieces of iron, and the quality of iron is so carefully examined by us that contractors complain of the heavy obligations under which they labour in meeting our requirements, and we have a great deal of trouble in some cases to get them to continue the work." Four more fast, iron-hulled, sail-and-steam ironclads were ordered, yet on the basis that the 100-pounder Armstrong and 68-pounder gun were still the heaviest serviceable British ordnance, and "that if both the armaments and the iron plates which vessels carried were greatly increased in weight, the vessels would be very ill adapted for service at sea." These were

therefore ever longer and deeper than *Warrior* but at least more fully protected, carrying a heavier armament overall; the *Achilles* and the three vessels of the *Minotaur*-class. Conversions of wooden ships-of-the-line were also underway (the *Royal Oak*-class). Finally, guns mounted in revolving shields on Captain Coles' plan were tested the previous year with good results; Somerset "was at once satisfied that we had got a vessel which would be most useful for the protection of our harbours. But as there was no pressure for defence, and no alarm about the safety of our harbours, I did not think it necessary to apply to the Treasury for authority to commence that vessel at once." To ward off Parliament's alarm over fortifications as an efficient means of harbour defence, as well as justify the Admiralty's investment in super broadside-ironclads rather than a turret-ship flotilla—given the current pressure generated by news of the American ironclad action—the First Lord now had to belittle its actual "importance". Hence, the *Monitor* was "something between a raft and a diving bell", barely seaworthy, of poor (laminated) armour configuration, and armed with shell-firing Dahlgren guns which nevertheless had lower velocity than the 68-pounder. Though "these conflicts, viewed solely as matters of scientific experiment," were "highly interesting" to the Admiralty, they were, at most, only that.[362]

Meanwhile, intelligence reports were coming in that even the French were now taking "Captain Cowper Coles' plan of constructing iron plated vessels" under "serious consideration..."[363] Although one authority suggested smaller calibre rifled guns on either American ironclad, firing with higher velocity (rather than low velocity, large calibre smoothbores) would have proven more decisive, and that ironclads would ever be vulnerable to improved ordnance, Dupuy de Lome told Captain Edward Hore, R.N., he was "equally confident that he can always obtain more power of resistance than the

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362 3-4-1862, *Hansard*, 438-9.

363 2-4-1862, Hore to Earl Cowley, FO 27/1436. The French had also apparently slackened the pace of existing ironclad construction.

means of penetration brought against him can overcome, and that these cannot be pushed beyond a certain limit, at least on board of ships, for not only would the handling of the guns and shot become too difficult, but also the ships' decks would [not] stand the recoil and the strain."[364] If the French lead was to be followed in ironclads, therefore, it seemed likely that the broadside of lighter, though feasibly more powerful, guns was the way of the future—not American turrets and heavy guns.

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[364] 4-4-1862, Hore to Cowley, FO 27/1436.

V. Enter E. J. Reed, naval architect

These considerations from various sources further served to complicate relations between the Admiralty and Coles. Encouraged by the debate in Parliament the inventor-captain wrote to Paget to claim, first of all, priority of the "Shot proof Steam Raft"-concept over Ericsson's *Monitor*. His Crimean War proposals were of even lighter draft and smaller dimensions, though his hemispherical turret was fixed, rather than a rotating cylinder. Responding to Somerset's request to Grey for more details Robinson declared, however, that "no trace" could be found "of any report" in the Surveyor's department. Coles could also not "withhold from their Lordships the deep mortification" he felt "at the Americans' taking away the Palm of the invention from this country..." By giving "further publicity" to his "inventions and views to the Defences of Great Britain" Coles suggested he was saving England's honour—if not his own:

> I wish to point out to their Lordships how admirably those Steam Rafts could be adopted for the defence of our dockyards, Mercantile Ports, and Rivers. If in Peace time we only constructed a few as a pattern, and stationed them at the principal ports, when in case of being threatened with war, our rivers would swarm with them in an incredibly short time; they could be manned by our Dockyard men, pensioners, Coast Volunteers, and sea board population, giving an incentive to Voluntary services, and a specific understanding as to how, and what they were to fight in, when I believe no Vessel dare ventures near our Coast.
>
> If necessary to have a little more speed a few feet more length, draught of water, and more power would give it, it must be remembered that the great superiority which these Vessels have over larger ones which have to cross the Channel, or Atlantic to attack us is from their smallness, lowness in the water, rapidity in turning and light draught.[365]

But added publicity was exactly what the Admiralty and the Government did not want, and there was more than a trace of extortion in Coles' exuberant "offer". The Admiralty

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[365] ADM 1/5802, 11-4-1862; enclosed letter from Coles to Paget dated 31-3-1862.

would therefore not be patriotically drawn into a private dispute between rival inventors; two turret-ships, *Prince Albert* and the *Royal Sovereign*-conversion, were already committed for the purpose of "trying" his plan; and "the whole question" of smaller ironclads for coastal defence had been "for some months under the consideration of the Board", which would "not fail to take advantage of Capt. Coles' services should the adoption of his plan of arming small vessels be found desirable."[366]

Back in the House of Commons, the *Monitor*, the *Virginia*, and Coles' proposed turret vessels spearheaded a renewed attack on the Spithead fortifications on 4 April. The Opposition pointed out that while Coles' Crimean War ironclad plans were virtually on hold—while the Admiralty endlessly deliberated its merits—the new forts received *carte blanche* treatment. Yet "while we have been thinking, the Americans have been acting":

> They have been satisfied by the experiment, which is doubted upon the Treasury bench here, in the same way as the efficiency of the matchlock was doubted when it speeded the crossbow; of "Brown Bess," when it superseded the matchlock; and of the Enfield rifle, when it superseded Brown Bess. Our great men are very slow to be convinced; and unless the House of Commons urges them on—unless a lesson is taught us on our own shores by the burning of some of our own ships—they will be as slow as the men of former times were.[367]

Mr. Bentinck added, however, that the criticism of the House should not "at all be construed into an irritating or party feeling..." The Government "could not have dealt with this question before, because it had not arisen," but it was obliged by recent events to make some bold decision regardless. Though the *Monitor* was a "comparatively small vessel, a shapeless monstrosity", it was also virtually invulnerable—and John Ericsson, according to American newspapers, was now already busy designing improved, larger

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[366] ADM 1/5802, 11-4-1862.

[367] 4-4-1862, *Hansard*, 588-9. See also Michael Stephen Partridge, *Military Planning for the Defense of the United Kingdom, 1814-1870* (New York: Greenwood Press, 1989), 89-92, 100-119.

versions. Though the *Monitor* might not be able to cross the Atlantic, "it is perfectly easy to construct vessels quite as invulnerable,—and therefore quite as invincible as the *Monitor*, and yet possessing all the requisite sea-going qualities for making a passage to any part of the world."[368]

Palmerston's personal dislike for the *Warrior* and her "pasteboard sisters" would now have to be put on hold.[369] If conservative policy was mid-Victorian policy, the ageing Prime Minister would have to publicly defend his Admiralty's decision to invest in broadside-ironclads, though they were not in fact as fully armour-protected as the French counterparts. He was "not surprised", therefore, that "the public at large should have their eyes opened, and their minds struck, by the conclusions naturally derived from the event which has taken place." But as the First Lord of the Admiralty had demonstrated the previous day, the Government had indeed undertaken experiments of its own which had already suggested the relative invulnerability of armoured vessels against wooden ones. Moreover, the recent encounter in American waters also served as a warning of "what kind of vessel will not do for the general service which we require of our ships," since the crews of both American ironclads were stifled by their low freeboard, which also threatened their seaworthiness except in smooth waters. "Therefore it will not do to take these vessels as your model and when the House is told that they cost comparatively but a small sum, and were completed in a short space of time, I must say that is no ground sufficient for us to go on with respect to the ships we may construct." Tenders were being sent out for constructing a ship on Coles plan; "whether it can be made capable of going to sea is another thing, but for purposes of coast defence we are of opinion that the construction of that vessel will turn out most effectual." By the year 1864, Britain should have "16 iron ships, of different sizes, but all of a very respectable and formidable

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[368] 4-4-1862, *Hansard*, 602-4.
[369] See, for example, 27-3-1861, Palmerston to Somerset, SP.

character." As for the man-made island-forts at Spithead, only contracts for the foundations were made—the actual design of the forts to rest upon them were not yet settled by experiment.[370] Terminable annuities were planned to pay for their cost, which seemed reasonable since forts, unlike floating batteries, were considered long-term investments. If however the House wanted the Government to suspend those contracts until a new Commission re-examined the question of batteries or forts, or batteries and forts combined for national defence, then it would be done. For now, it was obvious that "floating defences can be constructed more rapidly than forts," and that "so long as those floating defences were not sent elsewhere—so long as they were available, and had their machinery in order, they would, in all probability, be as effectual...as forts." But it also stood to reason that future improvements in heavy guns would favour their being mounted on land rather than floating them at sea.[371] In fact, Palmerston was trying to defer any decision which might kill the fortifications scheme altogether until after the Easter recess of Parliament, waiting for events to cool down, and the public to diverts its attention once more.

Sir John Pakington, on the opposite side of the House, was not satisfied with the Prime Minster's explanation. As Palmerston noted, £1,000,000 was recommended for the construction of floating batteries by the 1860 Defence Commission, in addition to the £9 million for fixed fortifications. But even if long-term forts might be paid for by terminable annuities, and batteries could not, why was nothing for the construction of the latter put into the annual Estimates? Indeed, "up to this moment the Government have taken no measures whatever to carry out that portion of the recommendations of the Royal Commission." There was therefore no need to wait for yet another Commission;

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[370] 4-4-1862, *Hansard*, 606-10. The War Office Return on "National Defences", for the loan authorised to pay for the forts, listed £574,872 already spent by 31 March 1862, primarily in modernising existing defences of Portsmouth and Plymouth, with over £1 million already committed to buying land for fortifications, leaving £316,000 of the £2-million advance; £5,680,000 was estimated for completion; 26-5-1862, *PPs*, 1-3.

[371] 4-4-1862, *Hansard*, 612.

let the million-pounds be voted now for iron-plated "gunboats", before the French assumed too great a lead in both frigates and coastal defence/assault ironclads.[372] Paget countered by suggesting that the five line-of-battle ship conversions (the Royal Oaks) were "to be plated as floating defences", a partial truth inasmuch as they were *not* intended to operate as Ericsson's *Monitor* or Coles proposed flotilla of cupola ships. Thus another three-decker (the *Royal Sovereign*) was to be converted on Coles' plan "for Channel defence" as opposed to "harbour defence". Their draft would still be around 26-feet—hardly suitable for the defence of most harbours—but, as Paget challenged, "it is said that the Americans in the course of a few months plated the marvellous *Monitor*, and we in this country are behindhand; but supposing we were at war to-morrow, do you suppose we could not put forward our energies and create *Monitor*s by the dozen in a few months?" This was a sensible point, for the Americans were at war; Britain was engaged in an arms-race with France, and in such a contest the maintenance of long-range power-projection was perhaps more vital for international relations and a secure peace than even immediate defence closer to home, for purposes of deterrence if not practicality. How this strategy affected the forts was another matter. As Sir Frederic Smith observed, it was "all moonshine to suppose that a vessel passing [fixed forts] could be destroyed by heavy guns." Monitors were also, simply, much cheaper than forts, even if they were paid for immediately.[373]

But inasmuch as forts were part of the United Kingdom's overall vision of strategic defence mixed with offensive-deterrence, or hitting power—indeed, what else could explain the obvious preference being given to deep-draft, long-range ironclads?—coastal ironclads were not, even if light-draft turret-ships proved deadlier against broadside-ironclads than forts. In this sense, perhaps, the new technology represented by Ericsson

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[372] *Ibid.*, 614-17.
[373] *Ibid.*, 618-21.

and Coles was destabilising. Forts were classic elements of strategic defence which veteran statesmen such as Palmerston understood and knew their counterparts understood as well. Would reliance on an "invention" prove sufficient at the negotiating table or merely laughable? The extraordinary lessons from the Battle of Hampton Roads could not yet outweigh the larger history of conflict, in Europe, where ships-of-the-line and forts were acknowledged playing pieces in the high-stakes game of international diplomacy. A Cabinet Memo from Sir George Grey acknowledged there was "a good deal of truth" in Coles' arguments, "but it is a truth no one denies. Every one admits that we ought to retain our maritime superiority and to render an invasion impossible if we can by our first line of defence—the Navy":

> ...but Captain Coles appears to me to overrate the power [turret vessels] would give us of defeating an attempted invasion, if, as in the case he assumes, "Our fleet should be ordered or called away for the protection of our colonies and commerce." His 20 iron ships might be concentrated rapidly at a given point, but what is the French fleet doing all the time?[374]

Somerset later added in the House of Lords that forts served another psychological purpose: to defend the country "against panic attacks at home".[375] At any rate, the final vote of 74 to 13 successfully suspended "the construction of the proposed Forts at Spithead until the value of iron-roofed gunboats for the defence of our Ports and Roadsteads shall have been fully considered..." A new Committee would convene 1 May 1862 to consider diverting any money set aside for fortifications to construct or convert coast defence ironclads instead.[376] The possibility of Royal Navy monitors was therefore also put on hold, despite Hampton Roads.

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[374] Sir George Grey, undated memo, 1862, GP.
[375] 11-4-1862, *Hansard*, 853.
[376] 4-4-1862, *Hansard*, 613-14, 630.

During this time, Edward J. Reed, described by Robinson to the Board of Admiralty as a naval architect by profession, "educated at the central Mathematical School at Portsmouth", was hired to build a small ironclad of "novel description" for the navy. The Controller was looking for alternatives to the wooden conversions and the big iron-hulled broadside ironclads; ships with greater handiness and armour protection, with less demanding construction and perhaps also lighter draft.[377] Thus far "no plan that has yet been proposed, for partially Armour Plating small ships, has apparently presented the same prospect of success as this Design of Mr. Reed's," wrote Robinson.[378] The new "Armour Plated Corvette", H.M.S. *Enterprise*, had a fully armoured waterline belt, with thicker armour concentrated in a central 'box' housing a small but heavier battery, with traversing guns which would permit fore and aft fire. In essence, the vessel was similar to Confederate casemate-rams, though the casemate itself was not angled, and part of a larger, traditional topside which would facilitate the use of masts.

At once the "central-battery" system posed a challenge to Coles' proposals for lighter, seagoing ironclads which also concentrated armament into fewer but heavier guns, though mounted in turrets to permit wide fields of fire rather than traversing through alternate ports. But whereas Coles was still finalising even the shape of his turrets, from truncated cones to cylinders like the *Monitor*'s turret, and perceptibly failing to provide actual schematics for a vessel ready to build, Reed was a trained professional, a skilled engineer, creative and at least equally ambitious to mould Britain's new ironclads as Coles.[379] Robinson was prepared to offer Coles £20,000 "to surrender absolutely to the Admiralty all his Patent rights so far as they relate to Guns in Cupolas or Shields to be carried on board ship," with an obligation to "furnish such plans and drawings to the Admiralty

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[377] Milne meanwhile desired a hauling-up slip for Bermuda, "for effecting repairs of even small class ships which may have touched the ground." Docking and repairing *Warrior* or even *Defence* at Bermuda was currently impossible; ADM 128/21, 20-4-1862.
[378] ADM 1/5802, 14-4-1862.
[379] See ADM 1/5791, 17-4-1862, Coles to Robinson, and 20-4-1862, Coles to Romaine.

connected with his patent as they from time to time may require of him, receiving while so employed a remuneration to be fixed by them on a fair and liberal scale." The Admiralty attorneys thought this "inconvenient for many reasons and objectionable as a precedent," drafting instead a proposal to the Treasury for a down-payment sum of £5,000 "and also a royalty of £100 for every Cupola built in a ship or fort during the time of his patent," which would expire in 1864. Again, the turret system was considered an "uncertainty" at best, though "an element which must be paid for..." Armstrong guns, another product of a private inventor, were by now an accepted component Her Majesty's fleet, but Coles' system was "hardly...a parallel" case, and was already inspiring "resentment" with authorities. This was exemplified when Coles pointed out to Romaine on 16 April that "Foreign Governments" were willing to pay him handsomely for his Shield-Ships, that the British Government owed him money after the successful trial of his system in the *Trusty*, six months previously, and that his plan was "pronounced by the United Voice of the Nation through both Houses of Parliament to be eminently successful and of the greatest value to the Country."[380] Coles was making a nuisance of himself, and worse, becoming a focal point of political embarrassment to the Navy and the Government.

When Reed offered to carry out the construction of the *Enterprise*, for which he would have to give up his regular work, Robinson suggested a fee up to £600.[381] This was a far cheaper (and much quieter) alternative to "giving in" to Coles and his supporters. The less radical central-battery concept was perhaps also less overtly "American" than coastal-defence turret-ships—vessels which strayed too close to the cutting edge of British naval strategy, policy, and economy by bringing national defence much closer to home shores than imperial interests required. The issue broadened when Newcastle, the

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[380] See ADM 1/5802, 25-4-1862.
[381] ADM 1/5802. 14-4-1862.

Colonial Secretary, argued against Somerset's remarkable proposal "to enable such Colonies as may be willing to establish a naval force of their own defence to do so," while William Gladstone, the Minister of Exchequer, was publicly challenging the expediency of increased military and naval expenditures—and infuriating Palmerston in the process.[382] Significantly, therefore, the London *Mechanics' Magazine* reported the laying down of the *Enterprise* at Deptford dockyard, comparing her not to *Warrior* or even Coles' "cupola vessels" but to "the American *Monitor*, of which the world has lately heard so much." The new type of British ironclad could be "sent to any part of the world" and was "the first which has rendered the application of extremely thick and heavy armour to our larger ships possible."[383]

This last factor was demonstrated as especially important on 8 April, when a new, experimental 12-ton gun designed by the ever-innovative William Armstrong pierced the *Warrior* Target at Shoeburyness with a 156 lbs projectile, firing an increased charge of 40lbs. The gun was smoothbore only, but Armstrong assured observers that if modified with rifling a 10-inch calibre, "300-pounder" could pierce the target at an even greater range. The American spectacle of ironclads firing away at one another, with apparently no effect, was clearly short-lived.[384] So was the concept of merely extending armour protection to greater and larger broadside-batteries.[385] Partial protection was once again mandatory, not on a point of seaworthiness, as with the *Warrior*, but survivability in

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[382] See 28-4-1862, Somerset to Palmerston, Newcastle's "Remarks upon proposal to introduce a Bill to enable Colonial Navies to be formed", and 29-4-1862, Palmerston to Gladstone, PP. Palmerston himself felt "a large yearly expenditure for Army and Navy" was "an economical Insurance" against the catastrophe of a French invasion—provoked in turn by weak British national defences. But Gladstone was not convinced adequate defence of this nature equated necessarily to larger expenditures than not; coastal defence (turret) ironclads vs. forts was the prime example. See Philip Guedalla (ed.), *The Palmerston Papers: Gladstone and Palmerston, being the Correspondence of Lord Palmerston with Mr. Gladstone 1851-1865* (London: Victor Gollancz, Ltd., 1928).

[383] Quoted from the *Scientific American*, 7-6-1862, 358.

[384] See 11-4-1862, London *Times*.

[385] Although Robinson, after a publicised visit to Chatham with the First Lord, recommended the armament of the *Achilles* be reduced from 50 to 30 heavy guns, all within the protected portion of the battery, considering it "very essential to the efficiency of the Ship to carry a belt of Armour Plating of 4½-inches in thickness right round the Ship in continuation of that which exists at present only for about 200 ft.," ADM 1/5802, 3-5-1862.

combat against heavier, more powerful ordnance. Armour must henceforward be thicker, just as existing guns were previously deemed "useless" in Parliament against iron sides. Though Somerset was complaining to Palmerston of all the crank proposals flooding into him every day as a result of the Hampton Roads sensation, only two classes of future ironclads stood a chance against the gun-makers of the testing grounds, if not also against potential foreign antagonists, namely France and especially the United States.[386] The *Scientific American* was reprinting U.S. Army Captain Rodman's letter to the War Department, dated a year before, explaining there was "no doubt of our ability to make reliable" monster smoothbores of 20-inch calibre, capable of firing solid shot of 1,000 pounds. With their "whole crushing force being brought to bear upon a single point at the same time, while that of the smaller shot would be unavoidably dispersed, as regards both time and point of impact," it was "not deemed probable that any naval structure, proof against that caliber, will soon if ever be built..." In the meantime, some fifty 15-inch calibre smoothbore guns, designed by Dahlgren, were already ordered by the Navy Department of the U.S. Government to be cast at the Fort Pitt Works in Pittsburgh. These would act as the new monitors' primary weapons.[387]

The infamous debate between Coles and the Admiralty, and then also Reed, intensified over the next few months. The victory of Armstrong's "150-pounder" over the *Warrior* Target prompted the Admiralty to test its powers against the trial Coles turret on *Trusty*. Coles objected that the turret in question was obsolete in comparison with the new gun, unlike the improved ones intended for the *Royal Sovereign*. The Board assured him, however, "the result of their intended experiments 'will involve no condemnation of the

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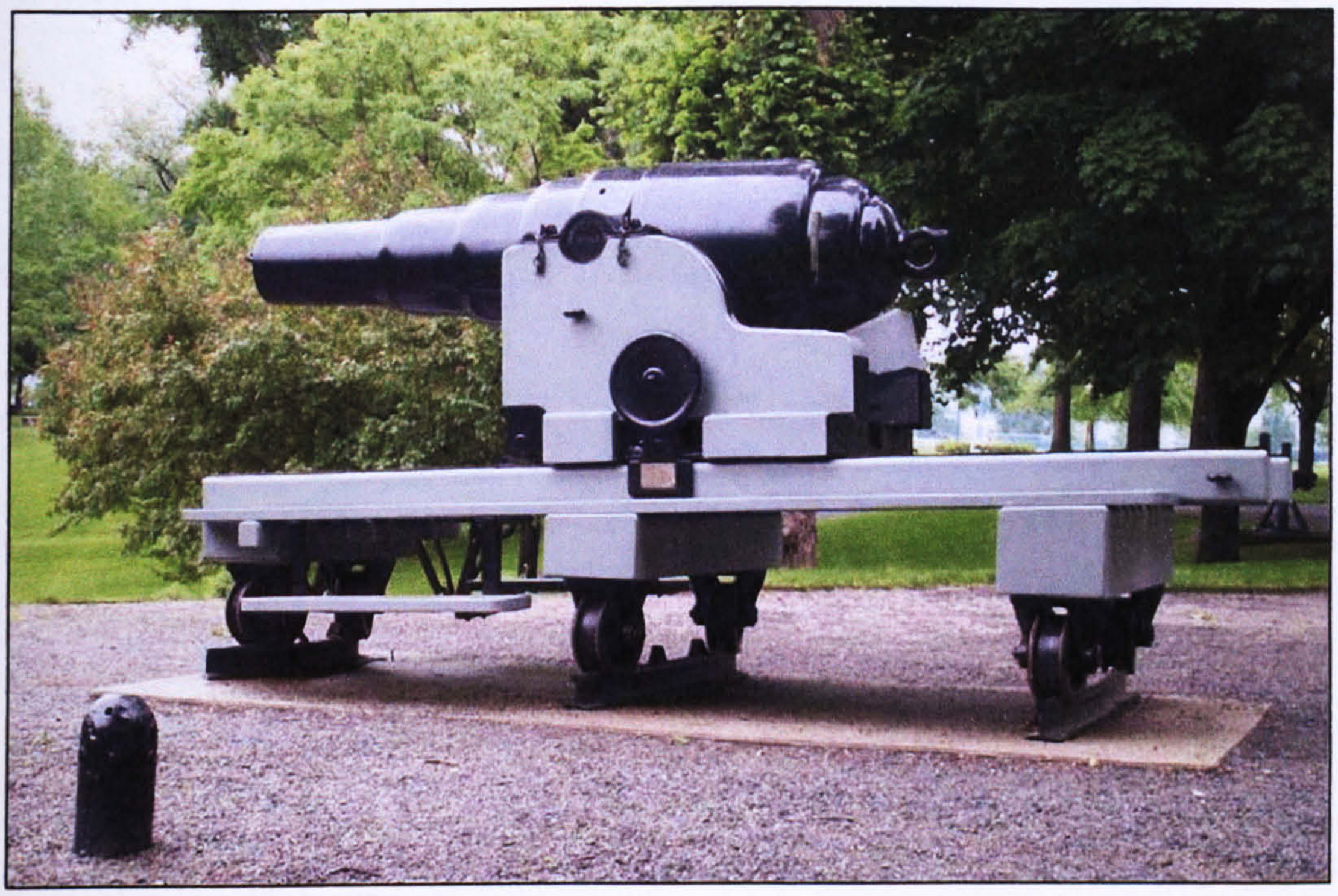
[386] See for example "Mr. Rothwell's plan of destroying an Enemy by squirting Vitriol and Naphtha into the Ports", in ADM 1/5802, 11-4-1862. Somerset quipped to Palmerston he had "letters now advising me to build ships to imitate the scales of the crocodile, the hide of the rhinoceros, the quills of the porcupine, the wings of the beetle, &c., &c.", 27-4-1862, Somerset to Palmerston, PP; also 22-4-1862, Palmerston to Somerset, SP.

[387] 3-5-1862, *Scientific American*, 282. The same page reported "The British Parliament on the Fight in Hampton Roads".



Armstrong 8-inch, 150-pounder, rifled muzzle-loader—captured at Fort Fisher in January 1865, and now a prize of the U.S. Military Academy at West Point, NY. (Author's collection)

Contrast the above with the Dahlgren 15-inch, 450-pounder smoothbore below, now at Filipstad, Sweden—one of a pair given by John Ericsson to his native country in 1865, to arm her first *Passaic* class monitor. These are believed to be the sole remaining 15-inch Dahlgrens in the world. (Author's collection)

principle of the Shield.'"[388] Indeed, *Punch* considered "floating iron shot-towers to constitute our fleet" something of a foregone conclusion; henceforth, sailors would be "frozen out" by "flat-irons with neither masts nor spars..."[389] Yet Coles' patent was itself still under negotiation, and the matter was now hopelessly entangled with his status as either a full or half-pay serving officer. On 3 May Coles wrote to the Admiralty claiming travel and subsistence expenses of £1 per day. When the Admiralty questioned why a full-pay officer should be granted these as well, Coles requested on the 10th that he be put on half-pay, "as I believe that it will enable me more fully to develop the advantages which I think may be derived from placing guns in revolving shields."[390] This was important, since half-pay status also technically allowed him to publish criticism of Admiralty ironclad policy—and promote his own scheme—without necessarily jeopardising his position with the Admiralty to supervise the construction of trial cupola vessels. Already Coles was privately writing to the editor of *Blackwood's* that "official prejudice is working hard against me..."[391] It was likely he also knew of Reed's increasing influence. When Coles considered offering the Admiralty a license to use his cupolas, rather than purchase his patent, so that he could retain the right to sell them to other (including foreign) parties, Sir Frederick Grey and Paget confronted Coles over his resort to the *Times*, while he was still on full-pay, and even proved willing to publicly retaliate against him in Parliament—much to Coles' horror. On 16 May Coles and his attorney thus decided to accept the Admiralty offer of £5,000 with a £100 royalty for his turrets extending to 14 years from the date of his original patent, "for the benefit of the Government and the Country," though Coles added he would probably "suffer pecuniarily by doing so." The Admiralty in turn considered Coles' request for half-pay dropped, but Coles may have waited too long. The following day Robinson suggested Reed "proceed

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[388] ADM 1/5791, 8-5-1862.
[389] 10-5-1862, *Punch*, 191.
[390] See ADM 1/5791, 14-5-1862.
[391] 12-5-1862, Coles to John Blackwood, MS 4168, f. 197-8, National Library of Scotland, Edinburgh.

to Portsmouth, Devonport, and Pembroke, to prepare drawings" for "Plating small Ships of War". Master Shipwrights and draughtsmen were to be placed at his disposal as well. "From the great amount of work in this Office," Robinson argued, "much delay would be avoided" by accepting his request, which the Board indeed approved.[392]

The Controller's attitude to Coles' patent changed. The inventor should retain his patent rights but not be allowed to extend his services to other parties. Assigning them to the Board of Admiralty would not "practically do what the Board wants."[393] With Reed on board, the Admiralty could better afford to do without Coles if need be; could Coles do better than the Admiralty? What would the public think if he sold his cupolas abroad but refused to "benefit" his own country for "pecuniary" reasons? Keeping Coles' turrets tied to the British Isles would prevent their spread to potential rivals, and by keeping free of commitments to Coles himself keep the Admiralty free from private or public manipulation of the development of the British ironclad program.

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[392] ADM 1/5802, 17-5-1862.
[393] See the various reports included with ADM 1/5791, 14-5-1862; Robinson's letter is dated 19-5-1862.

VI. Palmerston's policy

The threat was real enough. On 19 May the entire history of the program and its expenses up to that point was subjected to a blistering attack in Parliament by Lord Robert Montagu. Once more the Admiralty was accused of probably allowing dust to collect on "plans of a better form" of ironclad "which would also not be regarded until they had already done execution in the hands of the Americans." Worse still, Montagu motioned the Government to "appoint a Committee of scientific men, who would investigate the subject of ship-building with a desire to obtain a real knowledge of facts, instead of relying upon empty opinions." This would clearly take decision-making out of the hands of the professionals, the Navy, and especially the Surveyor (Controller). Earlier evidence before an Admiralty Committee stated:

> Generally speaking, if it is a matter connected with ship building or fitting, it is submitted to the Surveyor of the Navy, and, in common language, he pooh-poohs it... I very much question whether you will find one single instance in which an inventor has gone to the surveyor's office and received an acknowledgement of his invention having been good...

The House now called for a Return of "the number of proposals or plans, for the purposes of shot-proof ships, which have been received at the Admiralty during the last three years...and if any such proposals or plans have been referred to a Committee..." Paget demurred, since "inventions in reference to iron-cased ships come to us at the rate of about 100 a month..." It was also advisable not to move "too fast", though "we have no less than seven different classes of ships in progress of the iron-cased family, by various inventors, some of which are plated right round, and others plated only amidships."[394]

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[394] 19-5-1862, *Hansard*, 1933-45.

At any rate, the Motion was prefatory to a much wider offensive in Parliament against the Government's "National Expenditure". The public, much less the politicians, was still not satisfied by the answers given by the professionals. Foreign powers still seemed "ahead" of Britain, while Coles was seemingly still left behind by the Admiralty. Instead, the Government was spending more money than was needed on outdated forms of defence, the fortifications, and even its choice of ironclads was increasingly suspect. "Old Pam", the consummate political master, braced himself for yet another struggle. On 23 May Somerset replied to Palmerston's request for details on French naval armaments that "the Revue Contemporaire of 30 April 1862 gives 6 iron-plated afloat, 10 iron-plated building, also 10 new floating batteries building in addition to the former batteries. The French iron-plated ships building are not progressing fast at present. If we go on steadily, we shall be equal if not above them by next spring. It is difficult to speak on the subject, as some are anxious to stop our progress, others wish to excite unnecessary alarm."[395] Exaggerating the French threat might lead to criticism of the Government; but ignoring it would do the same.

The same was true concerning the United States. A letter from an American informant providing first-hand details of the *Monitor* and the *Virginia* warned "the Americans are a most impulsive people, and just now everybody wants iron clad ships and I doubt not that in a year from this time, America will have at least 30 afloat, I have no idea that they will be all good ones, but in all probability they will all of them be more than a match for any ship not so protected, and should they get the largest number or have in any way the advantage, a War with England is as certain as the rising of tomorrows sun."[396]

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[395] 23-5-1862, Somerset to Palmerston, PP. The First Lord also argued "a retrospect of the comparative navies of England and France will prove that from the year 1835 to the year 1859, the naval expenditure of England has increased from 4 ¼ to 11 millions or 138 per cent; but the naval expenditure of France has increased from 2 ¼ to 8 ¼ millions sterling or 274 per cent. So that our rate of increase is only half that of France in naval expenditure," 30-5-1862, Somerset to Palmerston, PP.

[396] 25-3-1862, William Baynton to Robinson, forwarded to the Board of Admiralty, ADM 1/5802, 21-5-1862.

Four days later Palmerston thus wrote to Gladstone there was no foreseeable "Change of Circumstances likely to take Place between this Time and next February which would justify any considerable Reduction either of Army or Navy..." It was fundamentally a matter of national "security" vs. "economy", and Palmerston was willing to gamble the nation would support his own conception of a Government's primary duty, defence. Fear, or at least caution, was always more suggestive in people's minds than the Free-Trade, penny-counting, Liberal optimism of his opponents. An appeal to the lowest common denominator was one not necessarily one to enlightened reason but to the public mind—which Palmerston was highly-skilled at manipulating. "But these anticipatory Resolutions are nothing but a Trap for a government," Palmerston explained to his less experienced colleague—and dubious political ally. "They tend either to expose a Government to the imputation of breaking Faith with Parliament" (too much was being spent by the Government, and spent unwisely regardless of Parliament's concerns) "or to compel them to provide inadequately for the proper Demands of the public service" (economy at the expense of security, for which the Government could also be accused later). "I am unwilling to place myself in either of those Conditions."[397] How much, subsequently, could the Naval Estimates be reduced, Palmerston inquired of Somerset, "supposing always that our Friends in France and our Cousins in America should be well behaved and peaceable"? The First Lord replied "for the last two years I have kept steadily in view the measures which may assist the Government towards a reduction of expenditure without any great decrease of naval efficiency":

> For example in May 1861 we had in commission 306 vessels of all rates. In May 1862 we have 282 in commission. Again in May 1861 we had line of battle 1st rates, 2nd rates, and 3rd rates 30 ships. We have now of these expensive ships 21 in commission.

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[397] 27-5-1862, Palmerston to Gladstone, PP.

> We have constantly replaced on distant stations ships-of-the-line by frigates and larger by smaller vessels.

But the French had 11 serviceable ships-of-the-line in the Mediterranean as well as 2 ironclad-frigates ready at Toulon; Britain had 7 ships-of-the-line and might be able to send an ironclad of her own there "before the Autumn". This was "the great difficulty" in regards to reductions, "our position in regard to iron-plated ships." Foreign powers could not be allowed to gain any decisive lead, "yet the iron-plates add enormously to the cost of a ship":

> If France had not a large wooden navy in addition to their iron-plated ships we could easily cut down some of our two deckers and plate them; by which means they would soon be ready, and the cost of engines would be avoided. But it would not in my opinion be prudent to adopt this course except with a few ships, and those chiefly for mere coast defence.
>
> The degree of speed with which we should advance in preparing iron-plated ships is a question of such importance politically as well as financially, that I should be glad if some members of the Cabinet would agree to meet here when the matter could be brought before them with the information requisite to enable them to decide on the course to be pursued.[398]

The following day, however, Somerset wrote he could bring the current naval Estimate of £11,794,305 "below 11 millions" since the cost of current ironclads under construction by private contract would be reduced for 1863-4 year to £1 million, a savings of £450,000 from the current year's payments. The vote for timber might now be reduced but this would be counter-balanced by an increased vote for iron plates, those "for one of the wooden frigates now to be plated will cost about £40,000. This is a direct addition to the cost of a frigate as there is no saving on other materials to compensate for this."[399]

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[398] 1-6-1862, Palmerston to Somerset, SP; 1-6-1862 Somerset to Palmerston, PP.
[399] 2-6-1862, Somerset to Palmerston, PP.

The tumultuous debate in the crowded House of Commons on 3 June 1862 represented one of the most serious challenges to Palmerston's leadership ever—a debate revolving around the fortifications, the threat from France—instigated by the news of the Battle of Hampton Roads, the issue of turret ironclads, the state of the Royal Navy, and Coles. Palmerston objected to even the point of the various proposed Resolutions and openly reduced them as politically motivated, "whether the Gentlemen who sit on these benches or the Gentlemen who sit on the opposite benches are best entitled to the confidence of the House and of the country." If all parties agreed the nation's defences needed improving, there was no real need for debate. If, however, economy was considered a more pressing issue than defence, Palmerston declared it "better for the House to go at once to the question fraught with serious important consequences, instead of wasting time in discussing the comparative value of the Amendments which have been proposed."[400]

This aggressive move immediately put the Opposition, rather than the Government, on the defensive. Here too was an implied logic that "the proper Demands of the Public service," or "naval efficiency" was by definition incompatible with any significant reductions in naval or military expenditure. Though Lord Montagu held "a sincere and honest desire to promote economy in the financial arrangements of the country," he was shocked the Prime Minister had converted the question "into the stalking-horse of ambition, and the prostitute of our claims to power." Nevertheless, as Spencer Horatio Walpole admitted, no one really wanted the Liberal-Coalition Government to resign. Indeed, political stability in the wake of the Crimean War, and in the face of rising social, economic, and strategic pressures, was a positive necessity.[401] Palmerston's indignation was therefore more of an ultimatum to the House, reduced to expressing opinions on defence, but not to the point of denying his Administration, or "the Nation", of its

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[400] 3-6-1862, *Hansard*, 292.
[401] *Ibid.*, 294-8.

demands. John Bright, speaking through the uproar, was not surprisingly unafraid to call Palmerston's bluff. Assuming there was in fact no object politically "dangerous or subversive" by questioning the matter in the House; "if we are all in favour of economy, and so much in favour of it that we do not object to any definite statement with regard to it—I should like to know why we should have any party contest at all?"

> If the House is disposed for a debate, let us have a debate. But I ask the House—especially those sixty or seventy gentlemen who, a year ago, requested the noble Lord, in very civil and humble terms, to condescend in a little degree to diminish the expenditure of the country—Whether they now intend to set up the noble Lord as dictator absolute upon this subject?[402]

"The truth is, that the amount of the Military and Naval Estimates," Stansfeld declared, "is decided by general views of policy, which cannot be discussed in Committee of Supply." Taken for granted, such policy always allowed the Estimates to "pass almost as a matter of course." Humiliated by "the early disasters of the Crimean war, the temporary collapse of our military system, on its first trial after a long peace, before the eyes of Europe, and by the side of France," the popular cry for "the efficiency and sufficiency of our armaments" was to be met by the House "as a representative and deliberative assembly—not parrot-like, to repeat the public cry and leave all to the Government of the day, but to consider something of greater importance than any individual Votes in Committee of Supply—the great questions of the cost, the policy, and method of those armaments that may be deemed necessary for the purposes of the country." Were such armaments necessary in a time of peace, and therefore the taxes on the British population to pay for them? There was a contradiction at work even in terms of "defence", between England's determination "to be safe and to feel safe, and at the same time to hold her own before the world..." The former was "above suspicion", but the latter was "much more within the range of discretion, and within the limits of which...large economies are

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[402] *Ibid.*, 300-2.

possible—it is the possession of the means of aggressive warfare, and the preparation for the possibility of external warfare."[403] This struck at the heart of the mid-Victorian British Empire, between strategic concepts of national defence, imperial inviolability, and world-wide power-projection, or "deterrence". Coastal or harbour defence ironclads, on Coles' model—monitors—might deter attacks defensively but not provide for the deterrent threat of counter-attack. If such ironclads were designed first with a mind for coastal assault (in the British case, at least trans-Channel operations), and then longer-range strikes or blockades, early 1860s technology, at least, required ironclads of an altogether different fashion—Warriors rather than Monitors. It was a question of policy after all; and Stansfeld was a Member for Halifax.

That such a policy was "justly called for by the country, wisely sanctioned by Parliament, and legitimately proposed and carried into effect by successive Administrations", as opposed to the product of his own will, Palmerston declared he had not doubt:

> ...it is part of the duty of Parliament to enable the Government of this country to hold a proper position with regard to the affairs of the world, and, without interfering by force of arms, at all events to exert a moral and, I will not say, preponderating, but at all events a powerful influence in favour of the principles which this great nation so heartily and cordially approves. But to do this, it is essential that we should be in a position of perfect self-defence; and by self-defence I mean not merely self-defence upon the shores of these islands; we have interests all over the world; we have possessions in every part; and the perfect defence of the country means that we should...have the means not merely of defending our shores, but also of protecting those vast interests, commercial and political, which we have in every part of the world.[404]

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[403] *Ibid.*, 305-13.

[404] *Ibid.*, 327-8. See Daniel R. Headrick, "The Tools of Imperialism: Technology and the Expansion of European Colonial Empires in the Nineteenth Century", *The Journal of Military History*, 51, Issue 2 (June, 1979), 231-263, on how expanding British "commercial and political interests" and naval technology were often mutually supportive; also Robert Kubicek, "British Expansion, Empire, and Technological Change", in Porter, *Oxford History*, 247-69.

Palmerston therefore proposed an Amendment of his own, since "any Government that came down to this House to make a reduction simply as a claptrap attempt to gain momentary favour with the public, would soon find that they lost a great deal more than they gained." That House might state instead that economy would be studied and practiced by the Government, but would "not lose sight of its duty to provide adequately for the defence of the country, and"—this was an important caveat—"for the maintenance of our interests abroad."[405]

Implied here was that a string of coastal fortifications, leaving the Army in charge of directly defending against naval assault let alone invasion, would allow the Navy to "defend" interests abroad; protecting commerce and colonies, but also conducting blockades and coastal assaults of its own. Economy may not have been incompatible with defence, but it was a difficult proposition to reconcile with offence, or perhaps "strategic defence".[406] The amount of money invested in Britain's ironclad program reflected this dilemma, but certainly the offensive-character of the ironclads themselves suggested Coles' scheme for a coastal defence flotilla was fundamentally at odds with Palmerston's strategic thinking. Any challenge to this would therefore be regarded by the popular Prime Minister as a political one as well, and so, amid desperate shouts of protest Walpole's Resolution was accused of omitting "altogether the protection of the interests of the country abroad. His Resolution would confine the attention of the House to the defence of our shores."[407]

Again, Palmerston was not speaking to the House so much as he was consciously, bluntly addressing the press reporting the debate and the educated, interested classes of the

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[405] 3-6-1862, *Hansard*, 328-333.

[406] Less than 3 weeks later, however, Sir George Lewis declared in the Parliamentary Committee on Fortifications and Works "it is the characteristic of our naval and military system, unlike that of many other countries, that it exists exclusively for defensive purposes...", 23-6-1862, *Hansard*, 870.

[407] 3-6-1862, *Hansard*, 329.

public; would even the "man in the street" be willing to sacrifice the wealth and honour of the Empire, just to save a few pennies? How important was "position" to mid-Victorians after all? Palmerston knew better than most of his well-meaning though frustrated contemporaries. If they wanted "by the force of reason and the expression of opinion, backed by the moral weight of the country, to endeavour to influence in a liberal spirit the course of events" in foreign countries, for example, Italy—or perhaps also the United States—then the House should attempt to restrain the Government from spending whatever it felt was necessary to achieve this. Any proposed "humiliation" of the Government (Palmerston) by Parliament would be an humiliation of "public opinion". "I do say," Palmerston taunted, "that we [the Government] possess the confidence of the country."[408]

The Tory Leader, Benjamin Disraeli, had been "trying to give some meaning to a phrase so vague" as "the protection of our interests abroad". Strong garrisons, fortifications and naval squadrons "in every clime" defending commerce were no doubt "sources of respect for us with foreign Courts and countries." But England's real strength and influence had always been her moral resolve and "financial reserve" which simply sustained war efforts longer than most of her enemies. Economy in this sense was strength, not weakness. Where there was "financial embarrassment the results are certain, and comparatively speaking immediate, and a Minister may be a most popular Minister—he may have a majority of 200 in this House; but if his policy is that two and two make five, the time will come when all his majorities will not be able to maintain him in his pride of place."[409] It was thus also difficult to convince the man in the street "of the necessity of extravagant armaments" when Britain was, in fact, at peace, and Europe exhausted from wars and revolutions. Richard Cobden, a legendary though unpopular "Radical" since the

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[408] *Ibid.*, 333.
[409] *Ibid.*, 333-55.

Crimean War, could likewise dismiss visions of French "Command of the Channel" or even invasion in favour of "a great gulf yawning which none of us has the courage to look into or fathom," the state of the economy. The real strength of a nation rested not "upon armaments so much as upon its resources," and Cobden pointed to the difficulties Britain experienced with overbearing, expansionist America before the Civil War. There was a country which "was never armed", but which was now "manifesting a power such as I have no hesitation in saying no nation of the same population ever manifested in the same time." This was because debilitating pre-war taxation was kept to a bare minimum. The French were neither such a threat to warrant expenditure in the name of "defence". "The noble Lord [Palmerston], indeed, scarcely ever speaks but it is to produce some apprehension, some disquietude, with reference to French preparations." Of the "thirty-six iron-cased [French] ships—he always speaks of 'ships'—built or building" only 16 of them were sea-going frigates; the rest were batteries, "and of these five are actually lying in the warehouse at Toulon, having been built to be carried by railway to Lake Guarda to be used in the siege of Peschiera." What, indeed, was the point of a French *entente cordiale*, the trade agreement he himself had recently negotiated, when the object of the Prime Minister "was first to frighten people into the apprehension of danger of attack, and then find an excuse for a large expenditure of money, and at the same time to get for himself the credit of being a spirited Minister, enable to protect the people by all his forethought and preparation"?[410]

But Palmerston, "with that adroitness of which he is so great a master", Sir William Heathcote bitterly admitted, had successfully confused and diffused the House enough for now. Members were aware "how far the noble Lord's Government has gained in character by the course pursued to-night" and yet that the "financial subject" remained

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[410] *Ibid.*, 373-82.

open, unresolved, delayed.[411] Stansfeld withdrew his Resolution, unwilling to accept the sudden and unexpected responsibility of a vote of confidence which would might topple the Government—or irreparably disgrace himself and his supporters any more than Palmerston had already. Palmerston, writing in his diary later that night, declared a great "triumph" for his Cabinet which earlier that day at his house had "determined to oppose all the Resolutions but our own."[412]

The newfound political confidence of Britain's Prime Minister did not have to wait long for an opportunity to "exert a moral...and powerful influence" on foreign governments. When U.S. General Benjamin Butler issued his infamous Order of 15 May, which threatened to treat the women of recently captured and occupied New Orleans as "women of the town, plying their vocation" if they continued to harass Federal officers and soldiers, Palmerston angrily wrote the U.S. Minister to Britain, Charles Francis Adams on 11 June that "no example can be found in the History of Civilized Nations till the publication of this order of a General guilty in cold Blood of so infamous an act, as deliberately to hand over the female inhabitants of a Conquered City to the unbridled License of an unrestrained soldiery." Old Pam's opinion of Union "mob"-conscripts, or American soldiers in general, was not high. But "if the Federal Government chooses to be served by men capable of such revolting outrages," he concluded with a thinly-disguised threat, "they must submit to abide by the deserved opinion which Mankind will form of their conduct."[413] "Adams", Russell wrote to Palmerston two days later, was "in a dreadful state" about the letter over Butler. The Order was misinterpreted, and probably did not reflect the full wishes of President Lincoln. "If you would withdraw the letter altogether it would be best," Russell cautioned, "but this you may not like to do."[414]

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411 *Ibid*, 393.
412 Entry dated 3-6-1862, Diary (D/22), PP.
413 11-6-1862, Palmerston to Adams, PP.
414 13-6-1862, Russell to Palmerston, PP. See also Ephraim Douglas Adams, *Great Britain and the American Civil War*, 2 vols. (New York: Russell and Russell, 1925), 1: 302-5.

Even the debate over fortifications was far from over. On 23 June, Sir George Lewis told the House Committee on Fortifications and Works that construction on the Spithead forts was suspended until the following year, thanks to misleading public reaction to the Battle of Hampton Roads, rather than the results of British ordnance tests which suggested instead the vulnerability of ironclads—but urging a Resolution "to serve for a foundation to a Bill for continuing the Act" from 1860—adding that military "efficiency" was "only another term for increased expense".[415] This remark drew a sharp response from Bernal Osborne. The House was definitely "not pledged" to the scheme of fortifications for defence. Though the 20 May 1862 report of the Commissioners on National Defences was willing to largely dismiss the significance of the Battle of Hampton Roads, wooden Union steamships had since run the gauntlet of 200 guns from two Confederate forts at short range to capture New Orleans itself. The Armstrong 150-pounder, moreover, was tried under only ideal circumstances to establish its superiority over the *Warrior*'s armour protection (a target previously fired upon) and was, at any rate, an experimental prototype. Now the Government had ordered 20 more 300-pounders and authorised Armstrong to come up with a 600-pounder rifled (muzzle-loading) gun which would still have difficulty hitting a moving target 1,000 yards away—all at exorbitant price. "With a man like Sir William Armstrong going on regardless of expense, backed by the Government as his sleeping partner, I am afraid we may take further steps until we run up a bill large enough to require the addition of another penny to the income tax." There was more:

> If we are always assuming a pugnacious attitude, and initiating what is called a spirited foreign policy, the result of which has been to increase our taxation to something like £70,000,000—if we are one day drawing Reform Bills for Sardinia, another day lecturing America, and always pointing the finger of suspicion at

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[415] 23-6-1862, *Hansard*, 882, 871.

> France, the natural consequence must be that we shall have the income tax saddled upon us forever...[416]

Osborne noted the current Chancellor of the Exchequer, Gladstone's, own disapproval of Palmerston "'spirit of interference'" and Franco-phobia. These were "neither the traditions of the Liberal party, nor are they the traditions of that Whig party once great and flourishing." All this said nothing for the other Liberal platform (other than Peace and Retrenchment): Reform, which was "courted and caressed and adopted by both sides of the House in the palmy days of its Parliamentary prosperity; but now it is treated like an indigent and disagreeable connection, and not suffered to come into the House. Such, Sir, is the state of the Liberal party."[417]

Again, Palmerston's response deserves study, as a definition of British foreign if not naval policy in this period under examination. The Government would not use part of the loan for fortifications for the construction of floating batteries, even though these were the other vital ingredient for defence prescribed by the Report of the Commissioners, since forts were long term and therefore "it was fair to throw the burden upon some years to come by providing terminable annuities of thirty years...a burden we thought was too great to ask the House and country to submit to in the current year," whereas "floating defences were in their nature temporary, and could last only for a limited time." They ought to be paid for by a Vote in the annual Estimates. If Parliament was willing to pay extra for these types of ironclads, in addition to armoured frigates and fortifications, then so be it. But that of course would spoil any Liberal argument for economic retrenchment or "restraint". It was incontestable whether or not forts were needed, even assuming the Navy was to be regarded as the nation's ultimate guardian. "Go to Pembroke, go to Plymouth, go to Portland, go to Portsmouth, go to Sheerness, go to Medway—all these

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[416] *Ibid*, 905.
[417] *Ibid.*, 905-7.

fortifications are expressly intended for the protection of our arsenals and dockyards, without which you cannot have a navy at all. You might as well expect to have a good dinner without a kitchen, as a good navy without dockyards; and you cannot have good dockyards unless they are securely defended." This policy conveniently sidetracked the issue whether or not the Royal Navy could defend its own dockyards, in the form of ironclad-batteries (or what were traditionally known as "block ships"), rather than vastly more expensive fortifications (which also took years rather than months to construct.)

The public's reaction to the apparent invulnerability of the *Monitor* and the *Merrimack* at the Battle of Hampton Roads Palmerston derided in Cobden's direction as perhaps "the fourth panic". Though his Government had agreed to suspend construction of the forts, "we did not think the contest decisive". Gunnery experts had since promised to deliver ordnance which would restore the "general principle that forts as opposed to ships must have the advantage, because they may have a gun of any size you can manage, whereas a floating battery cannot sustain more than a certain weight." How this applied to armoured ships running a gauntlet of forts rather than fighting a fixed artillery duel with them was likewise another matter not mentioned by Palmerston.

More fundamentally, the tiresome debates in Parliament only served to question, confuse and weaken the resolve of the nation's leaders and therefore the real strength of the nation itself. "If all these opinions were acted upon," Palmerston complained, "the result would be that the country would have neither fleet, nor army, nor a dockyard, and that we should have to rely entirely on the goodwill, kindness, and forbearance of our neighbours to protect us in all possible contingencies against any difficulties in which we might be involved. I do not think that this is the feeling of the British nation." As to the charge that Britain's increased "defences" were in fact provocative and jeopardised peaceful relations with other (and especially comparatively defenceless) nations, Palmerston argued that a strong self-defence gained respect from potential enemies. "So long as

nations are equal, they are likely to be friends." The *Trent* Affair demonstrated how even long-term "Friends", or at least close trading partners, could quickly become enemies—and the value "of those means of defence which every nation is bound to provide for itself." That "peace" in this instance was preserved not by the military and naval equality of the Northern States with Great Britain, but Palmerston's ultimatum was, again, another matter. Unilateral domination seemed to serve Peace as well. Yet "these works, when complete," he assured the House, "will not be a menace to any country whatever, nor will they in any way increase the liability to war; but they will be a security for the continuance of peace."[418] Missing here too was a comparison with France's recent modernising of the defences of Cherbourg, opposite Portsmouth, an event which famously alarmed Prince Albert and the Queen after their visit there in August 1858, and which originally served as one of the strongest reasons Palmerston employed to counter-fortify the south-coast of England.[419] It was not in fact the "defensive" quality of the forts which maintained peace, but the continued ability of the Royal Navy to counter-attack France if need be. If the forts were to securely protect the dockyards, and good dockyards were essential for a strong navy, the purpose of a navy was to act offensively, not necessarily in the direct defence of its own dockyards. The Royal Navy would better defend its own bases by attacking those of France or any other enemy. Fortifications, even more necessary if other naval powers fortified themselves for similar reasons, simply restored a longer leash for the British Lion.

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[418] *Ibid.*, 944-53.

[419] "Never before had France had a great arsenal and excellent harbour directly facing the Channel and the South Coast of England. Capable of outfitting, sheltering, and despatching a great invasion fleet, Cherbourg seemed like a knife pointing directly at Britain's jugular," Hamilton, *Anglo-French Naval Rivalry, op. cit*, 83-4.

Summary:

The Battle of Hampton Roads had a profound impact on both the British and Union ironclad programs, though in remarkably different ways. For the U.S. Navy, attention was drawn seaward; improved monitors with improved guns might successfully contest British naval supremacy on the open ocean as well as along the American coastline. By August 1862, Harper's Weekly *went so far as to "take for granted that, if it became necessary, the large iron-clads which Captain Ericsson and Mr. Rowland are constructing could sail up the Thames to London Bridge with perfect impunity, sinking every war-vessel they found in their way, and could dictate terms to the British over the ruins of the House of Lords."*[420] *Though probably not for a purpose this extravagant, Assistant Secretary Fox was still more willing to rely upon civilian contractor Ericsson than his own Bureau of Ship Construction & Repair. Indeed, Ericsson's* Monitor *was regarded as a much-needed boost in Northern morale and confidence in Lincoln's administration of the war.* Scientific American *observed that "Had the Navy Department undertaken last August to construct a vessel like the* Warrior, *the huge frame would be now standing on the stocks, with a prospect of being finished in the latter part of 1863, and the destructive course of the* Merrimac *would have gone on unchecked."*[421]

For Palmerston's Government, however, the example of the American ironclads, and especially Ericsson's taunting Monitor, *was politically* destabilizing—*ultimately forcing the popular Prime Minister to call the bluff of Parliament in a way Lincoln could have never dreamed of—even though, as* Blackwood's *remarked, "The debates of the present session...have been absolutely unparalleled for the absence of party spirit and party contests....to impute to selfish ambition the telling exposures of Ministerial incapacity*

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[420] 30-8-1862, *Harper's Weekly*, 546.
[421] 5-4-1862, *Scientific American*, 217.

which have of late proceeded from the front benches of the Left."[422] *This was because news of Hampton Roads focused British attention inward; to critically re-examine the character of England's own national shore-defences. Ironclad batteries, whether of Coles' pattern or Ericsson's* Monitor, *were clearly cheaper and faster to produce than fortifications—and arguably more efficient in checking the attacks of ironclad-frigates. This sense of economy strongly appealed to the mid-Victorian Liberal ideal, as well as the romanticised image of the highly pragmatic, highly inventive "Man of the Future" struggling against government red-tape and conservative "Old Fogies". Ericsson managed to escape this dangerous association, cultivating even closer ties with the most powerful elements within the Navy Department in order to secure future contracts. Coles, on the other hand, was quickly alienating himself from the Controller of the Royal Navy, and allowing his ideas to be publicly used as weapons against the Government.*

Part of the problem for Coles was his simple lack of professional shipbuilding experience or engineering skill, in direct comparison to Ericsson. In fact both Robinson and Fox increasingly relied upon Reed and Ericsson respectively, neither of whom were naval officers, but who were both nevertheless capable of supplying the types of ironclads their superiors demanded and *willing to do so without fundamentally questioning their authority. Facts spoke louder than words, in convincing each navy which model of ironclad was best for each nation; and both Ericsson and Reed were able to supply ironclad facts which Coles, in turn, could only allude to with editorials, lectures and colourful sketches.*[423]

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[422] June 1862, *Blackwood's Edinburgh Magazine*, 777.

[423] Ironically enough, within a week of Coles confidently expressing to Cobden his opinion that the *Dictator* was a "bad specimen" and "Ericsson a humbug", Robinson informed the Board of Admiralty "that at a recent interview Captain Coles informed Sir F. Grey that he wished to avoid the responsibility of designing a turret ship as a whole, he not being a naval architect..." 14-11-1864, Coles to Cobden, CP; and ADM 1/5892, 10-11-1864.

Another factor weighing in against Coles was his insistence upon ocean-going "shield ships", combined with his lack of technical expertise. If turret-batteries threw the Government on the defensive in Parliament, it was the allusion to dubious seagoing versions which allowed Admiralty spokesmen and Palmerston to charge that Coles and his supporters jeopardised the safety of the Empire for mere Liberal economy. As the ultra-Conservative Blackwood's *further remarked:*

> *There may be a difference of opinion as to the aspect of foreign affairs. Some may think that we could reduce our armaments if we were to cultivate a still closer alliance with France, and abnegate our own views and interests wherever a difference of policy arose with our Imperial ally. Others, like Messrs. Cobden and Bright, may go further, and believe it possible to dispense with all armaments, and establish a millennium of peace. The latter opinion is absurd; the former is untenable. England, in our opinion, is not one whit overarmed—we would almost say that we cannot be too well armed, considering the state of affairs abroad.*[424]

In truth, Armstrong's new 150-pdr gun had suddenly done as much as the Monitor *to demonstrate to the British, as Henry Adams wrote from the American Legation in London, that "their wooden navy, their iron navy, and their costly guns, [are] all utterly antiquated and useless."*[425] *It remained to be seen how each ironclad navy would adapt to ever-changing technological, strategic, and political circumstances.*

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[424] June 1862, *Blackwood's Edinburgh Magazine*, 784.
[425] 11-4-1862, Henry Adams to Charles Francis Adams, Jr., quoted from Worthington Chauncey ford (ed.), *A Cycle of Adams Letters 1861-1865*, 2 vols. (Boston: Houghton Mifflin Company, 1920) 1: 134.

PART THREE

Deterring Britain: The Trent *Affair Reversed*

I. Coles loses ground

Disraeli was quick to note that "the noble Lord's plan of defending our arsenals seaward by forts" had in fact "really been demolished by the general opinion of the country"; defence in itself was not being questioned.[426] This was where Coles rested his hopes, since the public was fascinated by the American high-tech *Monitor* as a potential—and perhaps also cheaper, if not more effective—means of national defence than Palmerston's forts. But the Government was not obviously going to abandon the forts, just as the public was unwilling to lose Palmerston, to the *Monitor*. Coles therefore largely gave up his attack against fixed land defences with light-draft, cupola-armed coastal defence ironclads and switched to a campaign against broadside-armed ironclads in favour of turret-ships. The more he ran into official opposition the more he relied upon political connections and the media. The events of the Civil War, however, which originally tended to support his system, later turned against him. Coles now had to distance himself from Ericsson's achievements and apparent failures with the monitor-class of ironclads.

But Coles' turret-ship ventures were stuttering forward only. Impressed with the new Armstrong 150-pdr guns, and insisting the *Royal Sovereign*'s turret carry the heaviest guns practicable as part of the system's principle, Coles now had to redesign the turrets larger than 22'8" diameter to accommodate at least a single gun—rather than 110-pounder rifled Armstrongs or 68-pounders. To do that required computations from the Controller's Department for "the total weight allowed for the 5 shields, their fittings and iron rings as proposed on the deck around them".[427] Robinson was impatient with the changes, and irritated by Coles' insinuations to the Board that the Controller's Office was in any way responsible for the delay. An Admiralty Return ordered by Parliament on 30

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[426] 23-6-1862, *Hansard*, 956.
[427] ADM 1/5791, 19-6-1862.

June 1862, "of all Iron-Cased Ships and Floating Batteries Building or Afloat", noted (as of 17 July 1862):

Iron-hulled (built):	*Warrior, Black Prince, Defence, Resistance*
Wooden-hulled (built):	*Prince Consort*
Iron-hulled Floating Batteries:	*Erebus, Terror, Thunderbolt*
Wooden-hulled Floating Batteries:	*Trusty, Thunder, Glatton, Aetna*
Iron-hulled (building):	*Hector, Valiant, Achilles, Minotaur, Agincourt, Northumberland, Prince Albert*
Wooden-hulled (building):	*Royal Oak, Caledonia, Ocean, Royal Alfred, Enterprise, Favorite*

Plus, under "Wood Built, Converting", the *Royal Sovereign*.[428] Added to this, Robinson now wanted to convert the 91-gun *Zealous*, "in frame at Pembroke", into a central-battery ironclad of 4½-inch iron armour protecting 16 guns up to 120cwt weight each, "with doors of sufficient size to admit of a Gun being taken from the battery on each side to a Port forward or aft which will enable the Guns to fire in a line with the ships keel."[429] This conversion was distinctly not to be another turret vessel.

Already on 22 May, Robinson had proposed an armour test-target for another Reed design, the *Favourite*—the same day he was advising against any further test of Coles' turret on the *Trusty*, which was so battered enough in the recent firing that five of the truncated cone's eleven 4½-inch plates, in Coles' words, "do not fit at the joints with that accuracy which they formerly did, and which the strength of the cone so much depended upon."[430] Five days later, a report from the Controller on whether or not to accept a Coles offer for two privately-built, iron-hulled ironclads, each "to carry two Shields on Capt. Coles' plan" did even more damage. There was no provision in the Estimates for these. "The great question therefore is," Robinson noted, "can any saving be made in the

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[428] 17-7-1862, *Return, "Navy (Iron-Cased Ships, &c.)", PPs.*
[429] ADM 1/5802, 2-7-1862
[430] ADM 1/5802, 22-5-1862, and 22-5-1862. Coles' enclosed letter dated 20-5-1862.

building of other ships in the Dockyards which shall counterbalance the expense of building such a ship by Contract"? Only if no other wooden conversions were made (the five Royal Oaks, the *Royal Sovereign*, and now the *Enterprise*) and thus no need for paying for more engines could £130,000 be saved, as well as the necessary shipwrights be freed from employment by the Admiralty, possibly in the Autumn. The savings in wooden materials would be counterbalanced by the added cost of armour plates. Though it was therefore "possible to build these two Ships by contract if it is so desired," Robinson did not "recommend that course" and indeed, from his own growing, bitter experience it would be "dangerous, to effect such large reductions in our dockyards and thus throw ourselves completely into the hands of Contractors and private builders..." Furthermore, this "class of vessel for which this sacrifice would have to be made, though admirable for the defence of the Channel and its Ports, would not be one adapted for general service at Sea, and this consideration would of itself influence their Lordships in not abandoning in the manner referred to the Construction of Ships of War in the Dockyards." If the wants of the country were pressing enough, the ships might be constructed at Pembroke and Sheerness, although those dockyards were not properly equipped or experienced for the building of ironclads:

> But considering how far behind our neighbours we are in the number of iron plated Ships of all classes, I would submit whether it is not necessary not only to build these two Ships for Channel Service by Contract but also to convert such of our Ships now on the Slips and in France, to partially Iron plated Ships with few but heavy Guns, their batteries and water line being wholly protected by 4½-inch Armour Plates. In all our Dockyards, there are Ships in a state to admit of this proceeding.

This referred to Reed's central-battery concept, which might be applied to corvettes, which would "require considerable strengthening"; frigates, which could be "altered with greater ease, but with rather more waste of material"; and even the Line-of-Battle ships such as the Royal Oaks, "involving however a still larger proportionate loss of work

OLD SALT. "*Ah, Master George, it's no use devotin' your talents to building Wessels o' that there class, now-a-days. Why don't you invent a sort o' Iron Biler as will sail without Canvass, revolve without Steam, and go to wind'ard without ne'er a Rudder, like them in Amerikey!*"

Captain Cowper Phipps Coles, R.N.

(from Arthur Hawkey,
Black Night Off Finisterre)

Edward James Reed,
Chief Constructor

(from National Portrait Gallery website)

Punch, 31-1-1863

already done." Were turret ironclads even that necessary? "The objections to altering Ships designed for one purpose and adapting them to another are obvious; but the objections to throwing away all that has been already done for the purpose of beginning an entirely new system, seem to be still more conclusive, against the latter course." Only if the Navy were willing to apply for a greater Vote should the cupola ships be built by contract, while the dockyards continued to convert the frames of existing wooden steamships, first on the *Royal Oak* pattern, then on Reed's. As far as Robinson was concerned, with various foreign powers now investing in armour-plated ships, it was "impossible to put ourselves on an equality with our rivals without incurring an excess of naval expenditure."[431]

Despite the Admiralty's previous assurances, Coles anticipated their hesitation over his turret-ship principle, and suggested improvements to the *Royal Sovereign* (and *Prince Albert*) designed not only to make the ship itself much more formidable against an enemy, but impressive to the Board. Instead of four hand-revolved turrets with one 68-pounder and a fifth turret with two, the ironclad-conversion should carry either four or three larger (26'-diameter), steam-powered turrets, each with a pair of the forthcoming Armstrong 150-pounders. This echoed the U.S. Navy's proposal to convert the steam-frigate *Roanoke* following the Battle of Hampton Roads.[432] Whether or not Coles was aware of the details of the *Roanoke*, possibly through New York newspapers, he insisted masts "of the very greatest importance...circumstances might occur when the want of them would paralyse all beneficial advantages of the Shields":

> Consider this Vessel sent outside the Isle of Wight to grapple with an enemy in a sea way, something, although for a short time, gocs wrong with the Engines, and she has no head sails, or means of

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[431] ADM 1/5802, 27-5-1862.

[432] ADM 1/5802, 4-7-1862; Coles' enclosed letter dated 1-7-1862. See 19-3-1862, Lenthall and Isherwood to Welles, RG 45, Letters Rec'd.

> getting her head the right way, lying in the trough of the Sea, she would be at the mercy of her antagonist. Again, when she has but a narrow space to turn in, and a good breeze blowing, her head Sails would be invaluable. If she is caught in a gale going across the Channel, or from Portsmouth to Plymouth, thick weather comes on, and she cannot run into Port, I believe she would roll herself, shields, and all to pieces, for it must be remembered that this Vessel having her weights low, and great beam, will be very quick in her rolling motion.

Therefore Coles wished "to record that if these Ships are tried without Masts, it may vitiate the whole principle of Shield Ships." Robinson, however, informed the Board he saw not much advantage of a single 150-pounder over two 68-pounders, and that "considering the possibility of totally disabling a shield, which an unforeseen accident might bring to pass, it would not be wise" to reduce the number of shields in order to carry heavier ordnance "even if it were practicable". The larger number of smaller shields, with their lighter guns, should remain. Converting their rotating power to steam was already to late, and time was a factor. Rather than wait for a possibly improved prototype turret conversion on Coles' plan, Robinson argued it was instead "extremely desirable to show with what rapidity this work can be executed and to turn out of hand promptly what must prove a most formidable engine of war, deferring some possible improvements until further experience has been acquired, and until the construction or alteration of another vessel may afford the means of adopting them with facility and economy."[433] But this was becoming extremely unlikely, and a lightly armed turret ship unable to sink the *Warrior*, as Coles had promised for years, would hardly be regarded as the new role model ironclad for the Royal Navy. In the meantime, Robinson was complaining to the Board that "the greatest possible inconvenience is felt both as regards the *Royal Sovereign* and the *Prince Albert*, from the want of the Drawings of the Shields which Captain Coles was requested to furnish in April and May last."[434]

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[433] ADM 1/5802, 4-7-1862.
[434] ADM 1/5791, 8-7-1862; Robinson's notation remarks dated 10-7-1862.

In England matters were complicated by Coles' application for half-pay status, finally granted by the Board, but not after the issue was paraded through the Commons—in connection with the fortifications debate—on 16 July.[435] Now Coles was technically free to further publicly express his opinions "not as a Naval Officer serving in the Fleet, but as a Patentee protecting a valuable invention". This implied Coles could 'do more good for the Navy' outside of his strict professional obligations (and the chain of command), as a civilian-inventor, than otherwise, promising in turn "I shall not relax in my exertions to carry out the details and adjuncts connected with the application of my inventions in any way [the Admiralty] may be pleased to order."[436] But whatever Coles gained politically from his ability to join the debate on national defences, by promoting his cupola-ship system as an officer on half-pay, he also lost professionally. What he needed were powerful friends within Somerset House who might counter the increasing influence of Admiral Spencer Robinson and Edward Reed on the issue of turrets vs. broadsides—or central-battery ironclads. It therefore became a question of what would determine the Admiralty's ironclad-building policy more, external political and public pressure or the Controller's Department?

Nor were battle lines so clearly drawn, at least yet. On 26 July Robinson reversed his opposition to Coles' proposal for a single cylindrical turret of 25' diameter (rather than two of 22'6") in order to house the new 12-ton gun on the *Royal Sovereign*, even adding "on the whole I think Captain Coles' plan preferable to the design made in this Office, and would recommend its adoption."[437] It was also still undetermined what form sail-and-steam broadside-ironclads themselves should take. On 7 August Russell privately communicated to the Duke of Somerset his own ideas "about the distribution of the Navy, so far as foreign stations were concerned." Only in the Mediterranean and

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[435] See 18-7-1862, *Hansard*, 505-510.
[436] ADM 1/5791, 22-7-1862.
[437] ADM 1/5802, 26-7-1862.

"Home" (or Channel) stations were line-of-battle ships still required, but in numbers equalling those of France, Italy and Russia respectively; "large frigates and smaller ships" for the protection of trade in North America; and light-draft swift steamers for the suppression of the slave trade off the coasts of Cuba and Africa. Somerset in turn forwarded the Foreign Secretary's views to Palmerston, noting that with the *Defence* then in the Baltic, the *Warrior*, *Black Prince* and *Resistance* would hopefully be ready for Channel service "by the end of August". Since these ironclads, the only ones in commission in the Royal Navy, were "at least equivalent to ships-of-the-line" there was little need to commission more wooden liners as replacements. Instead, wooden-hulled conversion ironclads of the *Royal Oak* class should be ready by the spring of 1863, "and we shall wish to try these as a guide to future construction." Indeed, many naval officers already preferred these to the *Warrior* class.[438] When the Board issued orders to Rear Admiral Dacres, in command of the Channel Squadron, to proceed to Malta in mid-September he was also informed he was "at liberty to order the *Black Prince* and *Warrior* to return to England previous to his arrival at Gibraltar should he deem it advisable"—caution and uncertainty about the huge armourclads' sailing qualities were still clearly prevailing.[439]

At the same time the First Lord was amazed with the recent test results of Whitworth's rifled 70-pounder, which put a shell through 4-inch plate with 8-inches of oak backing at 200 yards. "I wish Sir W. Armstrong had been there to see it," he wrote to Lewis. By contrast, the experimental "Horsfall Gun", a monster 13-inch smoothbore weighing 24

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[438] 7-8-1862, Russell to Somerset, SP; 8-8-1862, Somerset to Palmerston, PP. Russell specified at least 8 line-of-battle ships for the Mediterranean Station rather than frigates, since "they tell in effect and naval impression far better". Any reduction in manpower would also drop Britain's naval power ranking to third, behind France and then the United States; 25-8-1862, Russell to Somerset, SP.

[439] ADM 3/270, 17-9-1862. At the end of October 1863, the *Royal Oak* class ironclad-frigate H.M.S. *Prince Consort* was nearly swamped on her maiden voyage from Plymouth to Dublin because of her heavy rolling, shipping seas in a gale—and then her only steam pump failed. Like the *Monitor*'s stormy maiden voyage from New York to Hampton Roads, she too barely survived the night; see Ballard, *Black Battlefleet*, 115-23; also 14-11-1863, *Illustrated London News*.

tons, also blasted a jagged 4-foot square hole through a full *Warrior* Target. This marked an important divergence of practice in naval ordnance: high-velocity rifled guns "punching" clean holes through armour vs. lower-velocity, heavy smoothbores crushing large sections of plate, or "racking" the entire structure. Either way, "iron-ships are rather down again," Somerset concluded, "and fighting at sea will not be the harmless amusement imagined lately." The Secretary for War agreed: "the history of scientific warfare has hitherto been a history of the power of attack on the power of defence. The iron plated ships seemed a move in the other direction but this superiority has been much reduced by the late experiment."[440] Inasmuch as guns had defeated armour on the fields of Shoeburyness, ironclads had also lost ground in the politically-charged attack against fortifications, with invulnerable steamships acting decisively on the "offensive". In that sense, guns were to defence what armour was to offence. In a matter of months the precarious equilibrium of warfare had changed again.

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[440] 17-9-1862, Somerset to Lewis, and 19-9-1862, Lewis to Somerset, SP. See the report of the Iron Plate Committee, dated 24-9-1862, found in ADM 1/5809.

II. The practical concerns against British intervention

By the end of September 1862 Britain's international relations also proved to be as unstable as her weapons-technology and associative defence policy. Although the Government fought hard over the spring and summer to protect the fortifications bill and the navy's ironclad program, on the basis that it was certainly not the time for liberal efficiency and retrenchment, Lewis could also confide to Somerset that a reduction in at least the number of men and stores voted seemed feasible.[441] News from the American Civil War (again) upset this forecast, in unpredictable ways. The repulse of Confederate General Robert E. Lee's invasion of the North, at Antietam Creek (or Sharpsburg) on 17 September, finally encouraged President Lincoln to issue a preliminary Emancipation Proclamation. This, he hoped, would help convince London and Paris of Washington's moral high ground over Richmond; the physical liberation of the slave, not the political triumph of his master. Yet bowing to the strategic threat of alienating the Border States, Lincoln only proposed to free those slaves in the Confederacy. Already the British public was appalled with the relentless character of the war; McClellan and the Union Army of the Potomac could not take the rebel capital that summer after all, and even under a different commander Northern arms were disgraced at the Second Battle of Bull Run. The Southern Rebellion was alive and well. Furthermore, it was on the counterattack. The policy of the Union had, in the words of the London *Times*, "produced enormous bloodshed, enormous waste of treasure, created an unparalleled amount of private suffering and public debt, and widened an originally small—and perhaps bridgeable—gulf into a yawning chasm, on each side of which stands a separate nation...never again to be reunited." *Punch* represented Lincoln and Jefferson Davis as two exhausted boxers, held up by laughing slaves, with the French and British looking on. "Interference would

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[441] 25-9-1862, Lewis to Somerset, SP.

be very Welcome".[442] Now the North seemed deliberately willing to incite a massive slave uprising in the South, a grisly servile war all too reminiscent of the recent, ferocious Indian Sepoy Mutiny of 1858-9. *Punch* considered this, in a deadly game of "Rouge-et-Noir" between the two American presidents, to be "Abe Lincoln's Last Card".[443] Even though Seward advised Lincoln to forestall an announcement of the Proclamation until Union arms could produce a victory—so that it would not be regarded as an act of "desperation"—the bloodiness of Antietam and the lack of any foreseeable end to the war nevertheless failed to convince the bulk of European opinion otherwise.[444] Napoleon III thus proposed to Lord Cowley, the British ambassador in Paris, on 27 October a joint mediation before the American conflict became conceivably even worse. The proposed six month armistice would include, above all, a suspension of the Northern blockade of the South.[445] But mediation might lead to formal recognition of the Confederacy; and this would most likely lead to war with an already irritated Union.

Palmerston was unusually cautious in the affair. Only "great success of the South against the North," he wrote to Russell weeks earlier, might convince the Yankees to consider foreign mediation. Antietam deprived of them of this opportunity, "but we do not yet know the real course of recent events, and still less can we foresee what is about to follow." More importantly for British interests, "as regards possible resentment on the part of the Northerns following upon our acknowledgement of the Independence of the South, it is quite true that we should have less to care about that resentment in the Spring

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[442] 5-8-1862, London *Times*; 13-9-1862, *Punch*.
[443] 18-10-1862, *Punch*.
[444] "...unless Lord Russell meant War, I think his letters [of 17 January 1863, to Lord Lyons] most unhappy," U.S. Senator Charles Sumner later wrote to Cobden. "I am tempted to tell you how our imperturbable President felt on receiving the Letter about his Proclamation. As he knew nothing of Lord Russell personally and very little opinion as a public man, he was not able to make the apologies for him which I could. And yet it was hard. The case was very bad. I doubt if all history shews an instance of a question of such magnitude being treated with such mingled levity & ignorance..." 26-4-1863, Sumner to Cobden, Cobden Papers. See also Beverly Wilson Palmer (ed.), *The Selected Letters of Charles Sumner*, 2 vols. (Boston: Northeastern University Press, 1990), 2: 160-2.
[445] Jones, *Union in Peril*, 199; "The emperor noted [to Confederate emissary John Slidell] that Union rejection of the offer would provide 'good reason for recognition' and, in a veiled but unmistakable reference to the use of force, 'perhaps for more active participation,' " 201.

when communication with Canada was open and when our Naval force could more easily operate upon the American Coast, than in winter when we are cut off from Canada and the American coast is not so safe." As long as England, France and some of the other Great Powers could act together, "the Yankees would probably not seek a quarrel with us alone and would not like one against a European Confederation." Russell believed—or rather hoped—Napoleon's commitments in Mexico made him vulnerable to British demands in Europe, namely over the French protectorate in Rome, as a condition for co-mediation, but Russia would not back any diplomatic alliance at odds with Washington.[446] Indeed, Russia was one of the few friends the United States had during the Civil War, a natural strategic partner in a world still dominated by the nations of Western Europe.

At any rate, a special British cabinet met previously on 16 October to deliberate intervention in wake of the news of Antietam and the Emancipation Proclamation. Russell, for his part, felt "unless some miracle takes place this will be the very time for offering mediation," and drafted a memo for the cabinet on the 13th which ridiculed in altruistic rather than practical terms Lincoln's reasons in freeing some, but not yet all, of the slaves.[447] Gladstone, already in some political trouble for a speech in Newcastle on 7 October (where he announced there was "no doubt that Jefferson Davis and other leaders of the South have made an army; they are making, it appears, a navy; and they have made what is more than either—they have made a nation"), also favoured intervention.[448] The American Civil War was "the most gigantic" and likely "the most purposeless of all great civil wars that have ever been waged" since it seemed incapable of any (domestic) military or political resolution. "Secondly," he wrote in his own printed cabinet memo, "it is certainly the one which has inflicted, beyond all comparison, the severest suffering

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[446] 2-10-1862, Palmerston to Russell, and 2-10-1862, Russell to Palmerston, PP.
[447] 4-10-1862, Russell to Palmerston, PP; copy of memo found in PP.
[448] Jones, *Union in Peril*, 182-6.

on the other countries of the civilized world, and has given them the best title to be heard, if they shall think fit to speak, on the question of its continuance."[449]

But the military and naval leaders of the cabinet, perhaps crucially, felt otherwise. "The [Foreign Office] wishes to do something before Parliament meets, and there is great risk of doing mischief," Somerset wrote to Lewis, who knew that intertwined with the idea of recognising the Confederacy was the political, if not moral issue of slavery and its probable expansion into new territories. It was highly unlikely the North was ready for foreign mediation. If they refused, what then? "The French having sent an iron-plated ship [the *Normandie*] to Vera Cruz," Somerset observed, "could hardly have done this against Mexico, which has no fleet and no fort to be taken. If they mean to recognise the South, it is well to have such a vessel in those waters, otherwise the ship is ill-suited to that climate and station." Lewis stated he could "understand effective assistance, in money and men, to the South," and could "understand sending our fleet to break the blockade." Had not France done this against Britain during the Revolutionary War? "But a request to them to be good boys and not to give one another black eyes and bloody noses, does seem to me the weakest and most hopeless course which could be conceived."[450]

Was Britain in fact ready to go to war with the United States? Writing to his Foreign Secretary, Palmerston again uncharacteristically preferred to wait a little longer for events to decide themselves. "The Love of quarrelling and fighting is inherent in Man and to prevent its Indulgence is to impose Restraint on Natural Liberty; a State may so shackle its own subjects but it is an Infringement on national Independence to restrain other

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[449] 25-10-1862, memo in PP, 7.

[450] 16-10-1862, Somerset to Lewis, 19-10-1862, Lewis to Somerset, SP. See also Charles S. Williams and Frank J. Merli (eds.), "The *Normandie* shows the way: report of a voyage from Cherbourg to Vera Cruz, 4 September 1862", *The Mariner's Mirror*, Vol. 54 (1968), 153-162.

Nations." But underlying this philosophy were practical military and strategic concerns. "A Rupture with the United States would at all *Times* be an evil but it would be more inconvenient to us in Winter than in Summer," he explained, "because our Communications with Canada would be cut off, and we have not there a Garrison sufficient for War Time. The French are more at ease in this Respect—they have no Point of Contact with the Americans, and their Naval Force is stronger than that of the Americans while they have less commercial navy to protect or to lose."[451] By 24 October Russell, not convinced the North would be willing to fight Britain if it could not maintain the Union, was nevertheless willing to concede that "if Russia agreed Prussia would, and if France and England agreed Austria would," and that "less than the whole five would not do." Such a coalition he must have known was unlikely, and the following day he wrote "it should not take place till May or June next year, when circumstances may shew pretty clearly whether Gladstone was right."[452]

In response to the recent French proposal, Lewis also modified his views. "Assuming...the right to intervene," he asked in another printed memo, dated 7 November 1862, "would such an intervention be expedient?"

> Greece and Belgium were small circumscribed districts, lying at the feet of the Great Powers of Europe, which the latter could manipulate at their will, so long as they were willing to act together. But the Northern States, even weakened by the Secession, are a great Power, and the intervention of European fleets and armies on the Potomac is very different from their intervention at Navarino or Antwerp. It is difficult and expensive to send large armies across the Atlantic, and the wooden ships of Europe would encounter the small iron-cased steamers of America, which, though not sea-going ships, would prove destructive in the ports and rivers.[453]

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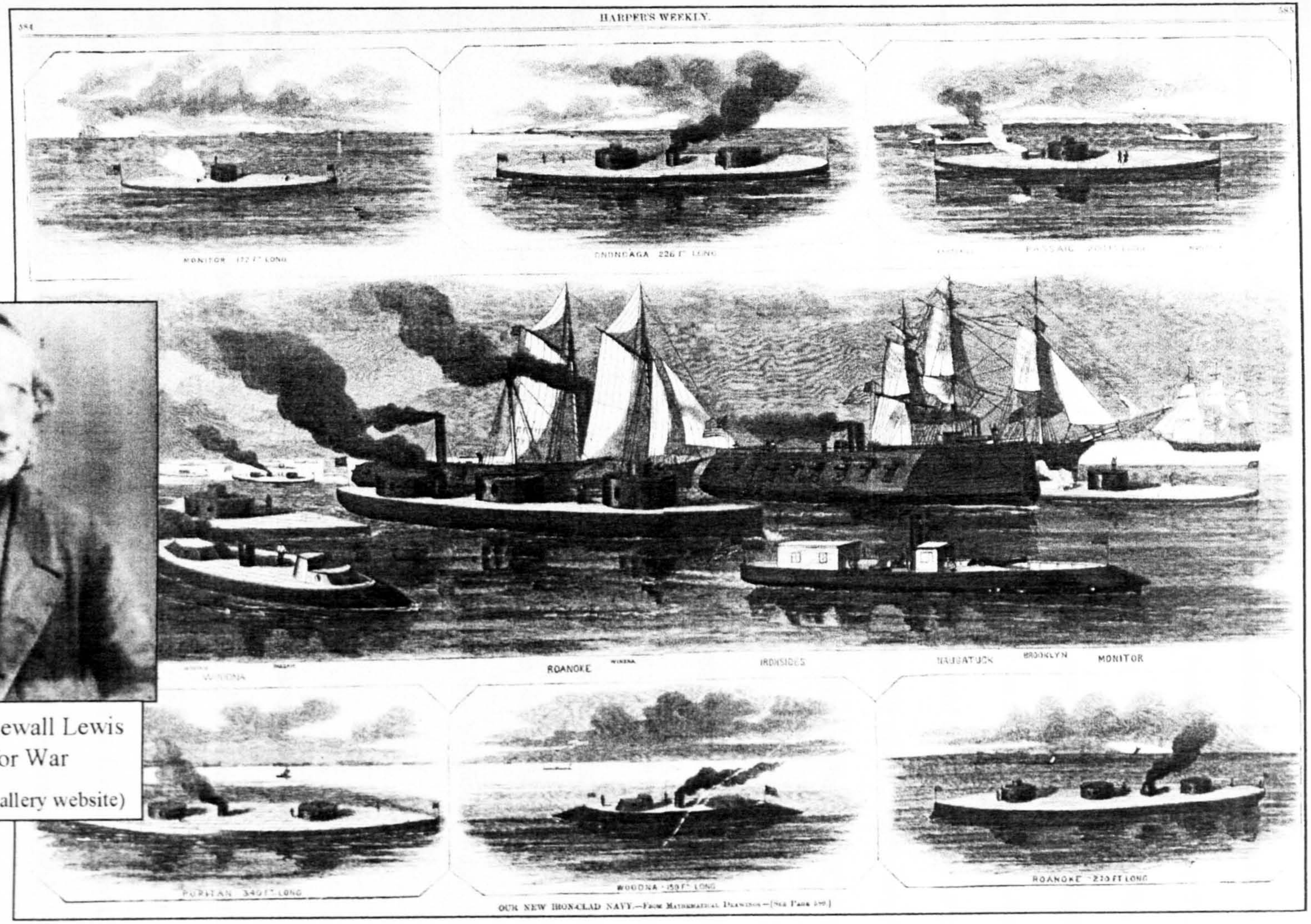
[451] 18-10-1862, Palmerston to Russell, PP.
[452] 24-10-1862, and 25-10-1862, Russell to Palmerston, PP.
[453] 7-11-1862, Secretary for War Sir George C. Lewis, *Recognition of the Independence of the Southern States of the North American Union*, WO 33/12, 2.

"Our New
Iron-Clad Navy"

*Harper's
Weekly*

13-9-1862



OUR NEW IRON-CLAD NAVY.—From Mathematical Drawings.—[See Page 589.]

Sir George Cornewall Lewis
Secretary for War

(National Portrait Gallery website)

Here was a decisive admission. Whatever the moral, political, or even economic justification for accepting the French proposal for co-mediation, Britain was as unprepared to act against the Northern states now as it was ready to do so over the comparatively trivial affair of the *Trent* less than a year earlier. The *Atlantic Monthly* later speculated that "two circumstances...were a restraint upon [Palmerston], and appealed with controlling force to his caution. He was not only an aristocrat and a hater of republics, he was also the Prime Minister of all England." Most of the British working classes supported the Union, and their political power was inexorably rising. Palmerston owed his own position to his remarkably skilful appreciation—or manipulation—of "the public" if not also the press (much to the consternation of his most Liberal opponents.) "His love of place is too strong to succumb either to personal prejudice or national jealousy; and the long habit has made the self-denial more easy." Furthermore, "while Lord Palmerston and Lord Russell are very apt to stalk about and threaten and talk very loudly at nations whose weakness causes them not to be feared, and by bullying whom some power or money may slide into British hands, they are slow to provoke nations whose resentment either is or may become formidable."[454]

Though this assessment was partisan enough, "the small iron-cased steamers of America", Ericsson's monitors, had clearly made an historic difference in Britain's foreign policy. Indeed, this was at least half their intention. "If the condition of our relations with other nations is less gratifying than it has usually been at former periods," Lincoln deftly understated to Congress, in his Annual Message of 1 December 1862, "it is certainly more satisfying than a nation so unhappily distracted as we are, might reasonably have apprehended." The accompanying Report of the U.S. Secretary of the Navy was more explicit. From a pre-war (March 1861) force of 76 men-of-war, Union naval power had jumped to 264 vessels by December 1861—136 of them converted

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[454] August 1864, *The Atlantic Monthly*, 245-8.

merchant vessels—and to 437 by the end of the year. Of these 123 were purpose-built warships, "completed and under construction", and 44 of them—more than a third—were armoured.[455] According to Gideon Welles, before the events of Hampton Roads (in fact, at the height of the *Trent* crisis), he had determined that Ericsson's model of ironclad "was particularly adapted to our harbor and coast defense, and service on the shallow waters of our sea-board…" Their purpose was clear. "Whatever success may attend the large and costly armored ships of the Warrior class, which are being constructed by some of the maritime Powers of Europe, cruising in deep waters," his Report continued, "they can scarcely cause alarm here, for we have within the United States few harbors that are accessible to them, and of those few the Government can always be prepared whenever a foreign war is imminent."[456]

After the diplomatic wrangling over intervention in the fall of 1862 Palmerston himself was noticeably frustrated. Though he was unquestionably popular at home, he could not bargain the French out of Rome, cynically complaining to the King of the Belgians on 18 November of the Emperor's professed reason of alienating the priesthood. "With his immense army devoted to him and a nation the great mass of which look up to him, and to nobody else, he might well do what is right and just without caring for fanatical Priests, sentimental Ladies, or intriguing Politicians. A Fait accompli would silence them all." This was an apparent freedom of action the British Prime Minister did not enjoy. Four days later *Punch*, in a similar vein, retreated from its earlier stance on the intervention issue with a cartoon entitled "One Head Better Than Two". Pointing to a scene of American battlefield commotion, a fully-uniformed Napoleon III asks "hadn't we better tell our friend there to leave off making a fool of himself?" "H'm, well,"

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[455] This did not include the 10 "armored wooden vessels, (transferred from the War Department)", for service on "Western rivers", but of the total tally of 54 ironclads, 28 were intended for the "Sea-board", and most of these were turreted monitors, *CG*, Appendix, Report of the Secretary of the Navy, 1-12-1862, 17.
[456] *Ibid.*, 17-18.

replies a civilian-dressed Palmerston with a knowing smile, "suppose you talk to him yourself. He's a great admirer of yours, you know."[457]

At the same time, local intelligence from British naval officers on the North American Station was arriving in London to confirm the boastings of the Northern press made that summer.[458] "I have lived long enough in this atmosphere of puffing not to be blinded by its smoke," wrote the *Times* correspondent from San Francisco on 29 July. But reports of an improved Ericsson monitor to be constructed there, possibly more, "must not be overlooked by our Government. They are suggestive at best; perhaps ominous." Mr. Ericsson had promised that " 'applications of mechanical science will put an end to the power of England over the seas, and render the United States impregnable against (to) the navies of the world.' "[459] From 4 September to 8 October Captain John Bythesea, R.N., an important figure in the history of British assessments of the Union's ironclad program during the American Civil War, toured U.S. naval dockyards and commercial establishments along the Great Lakes and the eastern seaboard, after participating in the Royal Defence Commission of Canada. Between Chicago, Detroit, Newport, Cleveland, and Buffalo he found some 6,000 shipwrights were employed; "foundries and machine work shops of every description" could be found in "all the important places, many of which, now employed in the manufacture of Agricultural implements and Railway rolling stock, could, in the event of hostilities, be employed in the construction of Marine Engines and iron cased Vessels." The Federal navy yards, however, were "inadequate to either the construction or maintenance of a large fleet. Private yards partially supply the defect." This must have sounded familiar to the Admiralty, especially the fact that "the

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[457] 22-11-1862, *Punch*.

[458] "...owing to difficulties of maintaining communications and other causes," Milne wrote a very intrigued Board of Admiralty, "it is not easy to collect trustworthy information beyond what the Newspapers furnish on this interesting subject, as I am not aware that there were any British Officers, or other authorities at or near the James River, or on the Mississippi, where the only serious actions between Batteries and Iron clad Vessels have as yet taken place," ADM 1/5788, 26-8-1862.

[459] 9-9-1862, London *Times*.

work done by contract is reported to be unsatisfactory and the expense to Government much greater than it would be if the public yards were on a more extended scale."

Still, Bythesea listed 14 ironclads (mostly armoured gunboats of the Western river flotilla) afloat as of 1 September 1862, "mounting 153 guns and representing 14,375 Tons", with another 38 under construction in both government and private yards.[460] Aside from the seagoing broadside-battery U.S.S. *New Ironsides* "nearly the whole of the Iron clad Vessels building are to be armed with heavy guns in turrets and to be protected with layers of inch iron plates on Mr. Ericsson's plan."[461] The British naval officer got a close look at one of these, the *Passaic*-class monitor U.S.S. *Nahant*, while at Boston, and provided details of her mode of construction. It was unlikely the monitors would be sent to sea, yet they were "fairly adopted for river and harbour defenses [sic]". Persons inside the turret could withstand the concussion of shot, he was informed by an experienced, though unidentified Union naval officer, as long as they were not in contact with the turret walls at the time, and "no inconvenience was felt by the firing of their own guns."

What truly made the Union turret-ships ominous *was* their armament, which would be either 15-inch Dahlgren-designed smoothbores, or 300-pounder Parrott rifles. Dahlgren himself, Bythesea wrote, "stated to me at Washington in April last that he did not think favourably of rifled guns larger than 40 pdrs. or of the range of any guns beyond 2,000 yards." At the time the Chief of U.S. Navy's Bureau of Ordnance was busily designing a gun "to carry a projectile of 20 inches diameter and spoke of adopting a plan which has

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[460] ADM 1/5791, 8-11-1862; see also ADM 1/5788, 13-11-1862.

[461] ADM 1/5791, 8-11-1862. Captain Ross, R.N., of H.M.S. *Cadmus* had the opportunity of touring the completed *New Ironsides* at Hampton Roads on the 24th of October, 1862. Though he found the vessel in "good fighting order", he believed a single shot would disable the rudder, which was "just awash", and she was "very difficult to steer when going more than six knots." The armoured bulkheads fore and aft, which protected the main battery, Ross considered inadequate; "a vessel getting athwart her stern, and being exposed to the fire of only one 50 pounder [a pivot on the upper deck], would soon drive in her after bulkhead and rake her gun deck," 25-10-1862, Ross to Milne, enclosed in Milne's 8-11-1862 collection of forwarded reports to the Admiralty, ADM 1/5788.

been submitted to him of a gun with 36 inch bore." Perhaps Dahlgren was indulging in his own boasts calculated to impress foreign minds. More importantly, "he was of opinion that for the protection of rivers and harbours the gun would soon be the principal part and the vessel only its carriage."[462]

Summary:

On 15 December 1858, Edward J. Reed delivered a paper to the Society of Arts on "The Ships of the Royal Navy". With the onset of the recent Crimean War, he noted "the fleets of England, though well adapted for battles by sea, and sufficient to drive the enemy from the open waters, were almost totally deficient of the class of vessels which were essential to the putting forth of our full power against his fleets and coasts. Nor was the want supplied with anything like that promptitude which the occasion demanded." By December 1862, it was questionable still whether or not the Royal Navy could cope with the American Union's newfound capacity for self-defence. The Civil War had undeniably become a unique source of strength as well as weakness for the United States. Federal defeats were more spectacular as the war evolved and the North mobilized its vastly superior resources, while Confederate victories for the same reason carried with them an increasingly noticeable edge of desperation. But on the sea the Union Navy remained an undefeated force, developing at an even more impressive rate—and with an iron backbone. Times had changed quickly indeed, and no one knew what to expect next. Even Reed in his 1858 paper asserted, with all the confidence of an Editor of the Mechanics' Magazine, *that the "attempt to build ships which shall be proof to solid*

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[462] ADM 1/5791, 8-11-1862.

shot—at least, to wrought-iron solid shot—is an altogether illusory one; and such ships are not urgently required."[463]

Captain Cowper Phipps Coles also found himself grappling with events apparently beyond his control. The attempt to introduce his cupola vessels at the cost of fortifications on a wave of popular support only confirmed instead that national pride was in fact imperial pride. Though doubts lingered about the seaworthiness of the experimental broadside-ironclads, these would hardly be dispelled by assaulting, in the press, as a half-pay naval officer, the broadside principle itself in favour of masted turrets ships—especially when the Controller of the Navy found what he was looking for in Reed's central-battery concept. "It is no merit whatever in such ships to have a large proportion of weight to steam power, obtained by means of excessive length and size", Reed, as Chief Constructor, recounted to a new first Lord of the Admiralty in 1868. "The merit of an armoured fighting ship consists in having a large weight of guns and of armour, carried by a short, cheap, and handy hull; and, judged in this way, the Bellerophon *is much superior to the* Achilles."[464] *Because Coles critically delayed the completion of his trial turret ship, the* Royal Sovereign, *in order to incorporate the almost daily changes occurring in heavy ordnance (and thereby decisively defeat the broadside), any initiative he may have enjoyed by the spring of 1862 was lost by the summer. Instead of representing an even greater economy of force, seagoing "shield-ships" were therefore relegated by the Admiralty as expensive, untried luxuries the public would have to pay extra for. This outcome was further assured by his own refusal to build a mere "battery" first.*[465] *Even Ericsson in a war-time navy had to address and*

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[463] Printed as Edward J. Reed, *On the Modifications which the Ships of the Royal Navy Have Undergone During the Present Century* (London: Robertson, Brooman, & Co., 1859), 13, 21-2.

[464] 3-9-1868, Reed to H. L. Corry, in MP. Ericsson made sure to take Reed's *Our Ironclad Ships* to task in 1870, comparing the *Bellerophon* with the *Dictator* in similar fashion; 12-2-1870, *Army and Navy Journal*, 397-8.

[465] In one of many angry outbursts, Robinson complained to the Board "how utterly untrustworthy and uncalled for are all [Coles'] remarks on what he chooses to call the determined opposition and

overcome many of the original Monitor*'s deficiencies—in habitability, ventilation, seaworthiness, speed, armour protection and armament—before his own version of a free-ranging capital ship found some acceptance with the powers-that-be.*

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condemnation of his principle, openly disclosed by Mr. Reed." Rather, the controller admitted there had been "an opposition to crude and impracticable ideas, which it was right and proper should be offered by those who have the responsibility of spending the Public Money and whose business it is to see that, Ships which can only carry certain weights are not burdened with double the amount their flotation will support," ADM 1/5840, 20-4-1863.

III. Summer of 1862: the tide turns against the Union

While the evolution of ironclads as weapons platforms intrigued British naval observer Captain Bythesea, the Union capture of New Orleans drew confusing lessons. Farragut's squadron did not include a single ironclad and faced potentially three, including the huge casemate-rams *Louisiana* and *Mississippi*. Though both of these leviathans were blown up by the Confederates to prevent their capture, *Louisiana* was complete enough to act as a moored floating battery near Fort Jackson. Porter already drew up close-range, desperate plans of how to deal with her armoured broadside.[466] The diminutive C.S.S. *Manassas*, a poorly armoured, semi-submerged ram armed with a single 32-pounder, made valiant efforts to check the progress of passing Union warships, but a few broadsides from the U.S.S. *Mississippi* were enough to overwhelm her thin plating and drive her ashore. The forts themselves were bypassed, but only after the barrier blocking the river was removed days before, nevermind the prefatory bombardment from Porter's mortar flotilla.[467] In an official report to Secretary of War Stanton, printed for Congress, Brevet Brigadier General and Colonel of Engineers Joseph G. Totten also declared "while it is true that floating batteries will be useful auxiliaries in many cases, and in some cases our only safe resort, it is equally true that their expensiveness, to build and maintain, and their certainty of decay, exact that we rely in general upon works ashore, where, for the same outlay, ten times the amount of artillery may be arranged, with imperishable cover, impenetrable to guns afloat." Ships would always be at the mercy of forts.[468] Welles, however, was already informing Du Pont, commanding the South Atlantic Blockading Squadron, of the Department's intention "to capture Charleston so

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[466] 27-4-1862, General Order, PFP.

[467] Though predicting the forts could not stop a well-executed dash by Union warships, Major General and Army Chief Engineer John G. Barnard proudly noted to Fox afterwards that "my forts were harder to take than supposed..." 11-5-1862, Barnard to Fox, FP.

[468] 19-5-1862, 37th Congress, 2nd Session, House of Representatives, Executive Document No. 115, *Change of Materials and Construction of Forts*, 6. Although the Congressional Resolution of inquiry was made on 15 April, Totten's letter to Stanton is dated 10-5-1862, well after the fall of New Orleans.

soon as Richmond falls, which will relieve the iron boats *Galena* and *Monitor*." These could be then be used in the same manner as Farragut on the lower Mississippi. "The glorious achievements of our Navy inaugurated by yourself give every reason to hope for a successful issue at this point, where rebellion first lighted the flames of civil war."[469]

Yet within 48 hours the prospects for a fairly straightforward, if not easy victory were mitigated by the Navy's repulse at Drewry's Bluff on the James River. Most of the damage to the *Galena* was inflicted by 8-inch solid shot, which stripped her decks of fittings and numerous gun crews.[470] "I have seen the elephant in the fighting line", Rodgers wrote to his wife. "I ran up within eight miles of Richmond and there found three separate barriers formed of piles and sunken vessels[,] the channel only as wide as the vessels length[,] the banks lined with rifle pits and sharp shooters and a battery of heavy guns on a hill some 200 feet high to protect the barrier." It was a formula for combined defence that would also prove effective at Charleston a year later. Unable to move forward like Farragut before New Orleans, the formidable Union ironclads were suddenly rendered sitting ducks. Significantly, no one was hurt aboard the *Monitor*, aboard which Anne Rodgers assumed her husband would be, "and therefore perfectly free from personal danger..."[471]

The *Monitor*'s new commander, Lt. William N. Jeffers, however, was not so optimistic. The *Monitor*'s guns could not be elevated to reply against heavy gun emplacements on bluffs 200 feet high. Obliged to anchor further downriver, the *Monitor*'s two 11-inch Dahlgrens were then handicapped by greater distance and therefore reduced accuracy,

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469 13-5-1862, Welles to Du Pont, RG 45, Entry 15.
470 See Rodgers' official report, dated 16-5-1862, to Goldsborough, *ORN*, Series 1, Vol. 7, 357-8. See also Executive Officer L. H. Newman's 16-5-1862 report of damages and Corporal of Marines John Mackie's account, 16-5-1862, RFP Rodgers himself later observed the iron fragments from the *Galena*'s shattered armour plating "became very formidable grape shot; our principal loss I am convinced was from them," 19-5-1862, John to Anne Rodgers, RFP.
471 16-5-1862, John to Anne Rodgers; 18-5-1862, Anne to John Rodgers, RFP.

"with the usual effect against earthworks."[472] Based on his previous experience against Roanoke Island, Jeffers told Rodgers it was "impossible to reduce such works except by the aid of a land force."[473] Perhaps anticipating the enormous disappointment from his superiors, if not the nation, the *Monitor*'s commanding officer soon compiled an official list of "defects" of his vessel. This would be the first in a long line of similar complaints, made for similar reasons, against these ironclads. The message would also be essentially the same: the machines were at fault, not the men who were obliged to fight with them. Give its naval officers and crews better tools and the nation could reasonably expect better results.

There was more. "The opportune arrival of this vessel at Hampton Roads, and her success in staying the career of the *Merrimack*, principally by the moral effect of her commander's gallant interposition between that vessel and the *Minnesota*, caused an exaggerated confidence to be entertained by the public in the powers of the *Monitor*, which it was not good policy to check." It was his duty, Jeffers wrote, "to put on record my deliberate opinion of her powers." His conclusions were striking: "Notwithstanding the recent battle in Hampton Roads and the exploits of the plated gunboats in the Western rivers, I am of the opinion that protecting the guns and gunners does not, except in special cases, compensate for the greatly diminished quantity of artillery, slow speed, and inferior accuracy of fire; and that for general purposes wooden ships, shell guns, and forts, whether for offense or defense, have not yet been superseded."[474]

This level of defiance, coming from a naval veteran in command of the nation's most celebrated engine of war, was sure to provoke an equally virulent response, touching, as

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[472] Ericsson calculated this distance, based on the degree of the guns' elevation, to be 650 yards, but pointed out that such an angle (6°) worked two ways: plunging Confederate fire could not penetrate the *Monitor*'s deck; 28-6-1862, Ericsson to Fox, EPLOC.
[473] 16-5-1862, Jeffers to Rodgers, *ORN*, Series 1, Vol. 7, 362.
[474] *Ibid.*

it did upon so many nerves. The White House still had every reason to believe that the "operations against Richmond may close favorably at any moment". Therefore the Department of the Navy ordered Goldsborough to prepare for "a sudden naval demonstration against Fort Caswell...without a moment's delay so soon as Richmond falls."[475] The *Monitor* was to be edged as close as possible to rebel works up the James, to spearhead reconnaissance. But on 2 June the *Monitor*'s engines broke down. Combined with the previous combat damage to the *Galena*, Goldsborough could only write his superiors he was "less confident of success" and that the "principal work is now, perhaps, more formidable than the Department is aware."[476] The commanding officer of the *Monitor* was meanwhile pointedly "much chagrined at the "necessity of forwarding the accompanying report of the senior engineer relative to an accident to the engine."[477] Jeffers was apparently as irritated by his reliance upon the *Monitor*'s mechanic as he was on the *Monitor* herself.[478]

Equally irritated was the *Monitor*'s designer. In quick response to Jeffers' report of 22 May, Ericsson wrote to Welles that it did not "convey a single new idea, nor does it develop a single new fact...relative to the construction of the *Monitor* not previously known to the constructor." Presently foregoing a point-by-point "analysis of the subject"—for he had precious little time for this—Ericsson could only assure the Secretary that the new monitors, "being pushed towards completion by all means that funds and mechanical energy have at command", were free from any previous oversights

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[475] 2-6-1862, Welles to Goldsborough, *ORN*, Series 1, Vol. 7, 445.
[476] 3-6-1862, Goldsborough to Welles, *ORN*, Series 1, Vol. 7, 448.
[477] 3-6-1862, Jeffers to Goldsborough, *ORN*, Series 1, Vol. 7, 449-50.
[478] See *Monitor* engineer Isaac Newton's letter to Ericsson of 10-7-1862, EPPA, in which he complains that "Jeffers' peculiar characteristic is that he has not an consideration for anyone but himself, so you may well imagine what I have to go through when he in his spacious and comparatively well ventilated cabin growls." In his opinion, it was not the *Monitor* to blame, "the hot weather alone brought out her defects", but "the stupid head powers of the Navy". Commodore Goldsborough in particular was "so thoroughly impregnated with fear of this bugbear [the *Virginia*], that half the Navy was paralysed." Welles later agreed, writing in his journal Goldsborough "had done nothing effective since the frigates were sunk by the Merrimac, nor of himself much before," 10-8-1862, Beale, *Diary*, 1: 73.

in the original prototype. "Lieut. Jeffers' assumption that the *Monitor*'s reputation is based on fictitious grounds", however, demanded "immediate refutation":

> The advocates of the new system so far from admitting that too much is claimed for it deplored the circumstances that *Monitor* was not supplied with powerful guns. How different the result, they say, if the impregnable turret had contained guns of proper calibre [sic] and strength...[479]

Having given Jeffers' report more thought, day Ericsson returned to his counterattack the following day. He had "no hesitation in saying that is a pernicious document, coming as it does at the very moment when you are called upon to decide the question of Iron Clad vessels." Nothing the *Monitor*'s own commanding officer wrote overturned "the success, of every essential feature, claimed for the new system, and yet Lieut. Jeffers clings to 'wooden vessel and shell guns for general purposes.'" As usual when defending his monitors, Ericsson took to the high ground. "The commander of the *Monitor* evidently is not aware of the extraordinary—unprecedented—activity of the European dock yards in fitting out whole fleets of Iron Clad vessels at this moment, or he would not advise his government to rely on 'wooden vessels and shell gun', rather than impregnable iron vessels carrying solid-shot-guns protected by impregnable iron turrets."[480] What was the *point* of such reports, therefore, given their negative, unconstructive, almost insubordinate tone?

Perhaps the underlying issue of correct 'attitude' was behind the Department's 7 May decision to appoint Rear Admiral Francis H. Gregory, U.S.N., as General Superintendent of the new ironclads' troublesome construction—rather than Commodore Smith.[481]

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[479] 28-5-1862, Ericsson to Welles, EPLOC.
[480] 29-5-1862, Ericsson to Welles, EPLOC.
[481] For Gregory's zeal see 9-6-1862, and 11-7-1862, Gregory to Welles, RG 45, Entry 38. For a sense of Smith's alienation see also 19-6-1862, Smith to Ericsson, RG 45, Entry 464, Box 51. When Gregory submitted Stimers and Ericsson's request to install iron stringers in the *Passaic* monitors, Smith replied the Bureau was "of the opinion that any vessel of war requiring extra ballast to trim her is defective in

Indeed, there was no time for interminable debates on ironclad policy. Fundamentally-defect ironclads like the *Galena* Fox was not interested in even repairing; while Gregory wrote to Smith (in transmitting the latest instalment payment-bills for the monitors) that "Mr. Ericsson has over eight hundred men now employed at Green Point, working extra time and progressing energetically."[482] As W. L. Barnes, Ericsson's agent in Washington, wrote to Erastus Corning ("a member of Congress and a partner of Winslow in the Albany Iron Works"[483]), "the question of a Superior Iron Clad Navy has taken hold firmly of Capt. Ericsson's mind":

> No man in this Country is more intensely interested in it. He does not like English supremacy and be assured that if his advice is followed we shall energetically push the matter to an acknowledged Conclusion in our favor.[484]

Barnes also discovered from his recent interview in New York that Ericsson secretly authored the article on "Our Iron-Clad Navy" for the *New York Herald* of 26 June, which asserted the "position of the country at the present moment is so intimately connected with the power of our navy" (echoing his historic letter of 23 April to Seward).[485] Much of the credit for the powerful new ironclads under way Ericsson publicly attributed to the Secretary of the Navy and his Assistant.[486] "It has been objected that the Engineer-in-Chief [Isherwood] is not employed in the construction of the new vessels; but Secretary Welles, to the surprise and annoyance of many, has lately been found to entertain very peculiar notions on all matters connected directly with the efficiency of the navy, among which may be attributed that of putting 'the right man in the right place'." Ericsson the

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architecture"; 9-7-1862, Gregory to Smith, RG 19, Entry 1235; 12-7-1862, Smith to Gregory, RG 45, Entry 464, AD, Box 51.

[482] 21-6-1862, John to Anne Rodgers, RFP; 24-6-1862, Gregory to Smith, RG 19, Entry 1235.

[483] Baxter, *Introduction*, 278.

[484] 28-6-1862, Barnes to Corning, WP.

[485] 26-6-1862, *New York Herald.*

[486] Barnes revealed to Fox the same day that Ericsson had also "written in the strongest terms privately to the editor of the *New York Herald.* "This will probably end the latter's tirade of abuse," 28-6-1862, Barnes to Fox, FP.

civilian was simply a better-qualified engineer than the Navy Bureau Chief. As a result of this arrangement, Europe would soon "view with astonishment" a "prodigious display of energy and mechanical resources." The national agenda was clear: "The rebels are growing weaker every day; the Union feeling is spreading, and we will be ready to defy all the maritime Powers of Europe combined in less than two months. Napoleon in Mexico may then look out."[487]

Yet the President's own assessment of national, much less naval, policy was less than 'ironclad'. Indeed, the almost heady ambition to invest in continental-scale railroads and canals, in widespread coastal fortifications, and in monitors capable of defending American interests *anywhere*—all of which would challenge British naval supremacy on the high seas as well as along American's own maritime boundaries—only reflected the optimism still existent in the early summer of 1862; that the Civil War might soon be over. Lincoln may have liked to indulge in similar expectations, if not fantasies. The Homestead Act, passed on 19 May 1862, he heartily endorsed.[488] The *promise* of greatness afforded by "that portion of the earth's surface which is owned an inhabited by the people of the United States" was to him logically "well adapted to be the home of one national family; and it is not well adapted for two, or more."[489] But he of all people had learned that war was full of bitter surprises. Victory could not be assumed. Moreover, there was a fine line between actively destroying the enemy and merely avoiding defeat. Lincoln's visit in early May with General McClellan, to discuss the progress of the Peninsula campaign, did little too reassure him in this regard. By 28 June his "view of the present condition of the War", as he wrote to his closest cabinet advisor, Secretary of

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[487] 26-6-1862, *New York Herald.*

[488] Although this would surely aggravate future relations with Native American tribes such as the Cherokees and Sioux, who were already embroiled in the Civil War west of the Mississippi.

[489] 1-12-1862, Annual Address to Congress, *CG*, Appendix. Lincoln was fascinated with the prospect that, given "an average decennial increase of 34.69 per cent", the population of the United States could reach over 251 million by 1930—in direct relation to Europe's—*but only if* "we do not ourselves relinquish the chance by the folly and evils of disunion, or by long and exhausting war springing from the only great element of national discord among us": through emancipation.

State Seward, was that events had "enabled the enemy to concentrate too much force in Richmond for McClellan to successfully attack." A similar concentration of Union forces would only leave Washington vulnerable to a quicker thrust from Richmond. "Or, if a large part of the Western Army be brought here to McClellan, they will let us have Richmond and retake Tennessee, Kentucky, Missouri, &c." Instead, they should "hold what we have in the West, open the Mississippi, and take Chatanooga [sic] & East Tennessee" while "a reasonable force should, in every event, be kept about Washington for its protection." The North could then continue the mobilization of its vastly superior resources, fielding yet another army "in the shortest possible time", and eventually crush the bulk of Confederate forces in Richmond, carefully held in place by McClellan. If need be, Lincoln pledged he would "publicly appeal to the country for the new force, were it not that I fear a general panic and stampede would follow—so hard it is to have a thing understood as it really is."[490]

Sure enough, even as Lincoln, Congress, the Navy, the press and John Ericsson were all determining the best course of Union grand-strategy, the new Confederate general in charge of Richmond's defence, Robert E. Lee, launched a brilliant series of attacks on the besieging Army of the Potomac; the Seven Days' Battles (25 June-1 July). McClellan's loose grip on the war's strategic initiative was suddenly lost. Though Confederate forces suffered more dearly, the siege was lifted, and the Union Army was unquestionably back on the defensive. This in turn only placed more pressure on the Navy, and upon the precarious foreign relations of the United States. "If [McClellan] is not the man," Anne Rodgers anxiously wrote to her husband on 1 July, "where are we to look? If we are

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[490] 28-6-1862, Lincoln to Seward, LP. Lincoln called for 300,000 more volunteers, to enlist for three years, on 3 July. A month later this unpopular appeal would be amended to nine months.

defeated here England & France will be only too glad of the excuse to be counted in & we shall then be between the upper & the lower millstone."[491]

The next day, John Murray Forbes wrote to Fox, enclosing a letter from J. M. Beckwith in Paris, "a shrewd old Democrat long resident in France & well posted up there—a Hater of England & rather a lover of France—which makes his warnings the more valuable." From his perspective, Beckwith found it undeniable "that [the] aristocracy in Europe is arrayed against Democracy in America, and resolved irrevocably to break up the great Republic if possible." The growing strength of the Union army and navy had "quickened the instinct of self preservation & revived the alarm of the whole aristocratic class; they now see nothing but danger from the success of the North..." The proverbial iron fist of the European elite, however, would come wrapped in a velvet glove of diplomacy. "They know that...offers of friendly mediation will be refused & resisted, but they intend to embrace us with the affectionate hug of a Bear." Beckwith's only consolation was that a foreign war might unite the North and stiffen its determination even more. Napoleon III, in the meantime, was closely watching events in the Civil War, waiting for an opportunity. "The way the Cat jumps depends on the mouse—but the English feel very sure of the Emperor this time." Forbes himself was fairly disgusted with the performance of the Union army, and the need for even more reinforcements. "You cannot get soldiers now", he wrote Fox, "but there are plenty of mechanics & before you can recruit & drill into value an army of 100,000 men (representing 100 millions per ano) you can get under full headway—& indeed near completion—50 millions worth of Iron cased ship more than now ordered..." As far he was concerned, "these will be worth far more that the

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[491] 1-7-1862, Anne to John Rodgers, RFP See also Dahlgren, *Memoirs*, 373, 376-7, who was sympathetic to McClellan.

100,000 men—whether for subduing Domestic or preventing Foreign War. The *Monitor* stands us today in as good stead toward Europe as one whole army."[492]

All this served to only intensify Union ironclad shipbuilding efforts still further. Smith was threatening contractor Charles Whitney that "the time for completing [the twin-casemated ironclad *Keokuk*] is rapidly approaching, and if you are delinquent in this respect, heavy damages will be claimed under the contract."[493] Yet in transmitting progress reports of the ironclad contractors under his supervision to Smith, Francis Gregory found it "very gratifying to know that all are sensible to the importance of their labors in the present crisis, and appear to be governed more by patriotism than selfish considerations."[494] Work on the *Passaic*-class monitors was progressing rapidly. Smith was pleased. The contractors' bills were approved and the next payment instalments sent out.[495]

The ever-energetic John Ericsson took another view to Gregory's, however, especially after the 4th of July. "Our men observed the great festive day of the nation with so much spirit last Friday", he complained to Fox, "that they were unfit for work yesterday [Saturday]." As a result "we lose three valuable days in succession." Already cracks were beginning to appear in the ironclad construction business. The explosion of Government work available placed a high premium on labour. As far as Ericsson the contractor was concerned, "we have not got our men 'in hand' as we had a year ago." Furthermore, the Department's (political) need to balance the contracts for the six original, improved monitors under Ericsson's responsibility around the country was

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[492] 2-7-1862, J. M. Forbes to Fox, FP. Beckwith's enclosed letter to Forbes is dated Paris, 13-6-1862.
[493] 20-6-1862, Smith to Whitney, RG 45, Entry 464, AD, Box 51.
[494] 30-6-1862, Gregory to Smith, RG 19, Entry 1235. See also 30-6-1862, Gregory to Welles, RG 45, Entry 38. Welles informed Commodore Paulding of the New York Navy Yard he could not grant "the workmen full time for the day on which they were permitted to attend the Union meeting in New York." There was no precedent, and it was "not desirable to inaugurate such a system," 23-7-1962, Welles to Paulding, RG 45, Entry 328.
[495] 1-7-1862, Smith to Gregory, RG 45, Entry 464, AD, Box 51.

leading to irregularities in production. Relatively inexperienced and poorly equipped Pennsylvania and Delaware firms were failing to meet their deadlines, which only involved delays in other areas of the vessels. Not taking any chances, Ericsson would build both his seagoing monitors in New York.[496] This was bound to irritate other interested parties.

On 19 July Robert Forbes wrote to Fox from Boston. He had met "several of our principal mechanists & iron workers," and had "very little doubt from what they say, that by a combination of two shops, now doing little, a three tower ship could be got up here..." When Forbes suggested this to Ericsson all he received was a "laconic response of yesterdays date," in which "he makes no allusion to doing any thing here beyond machinery & he cautions me specially against promising more for this City than we can carry out." Forbes acknowledged the lack of investment capital "of our machinists" but insisted they were "as good workmen as exist any where in the Country & will do all they can to carry out any thing they undertake..." It would be imprudent for them, moreover, to promise "to do any large work very quick [or] very cheap—unless they can get their pay in the equivalent of gold or silver—it would be suicidal to do so."[497] But for Ericsson at least it was far too late to turn back. Already there were, as Gregory reported to Smith on 9 July, "over 1000 men at work at Greenpoint."[498] "We are pushing ahead the ironclad as fast as possible," Ericsson assured Fox. Besides, "A fleet of these vessels afloat at this moment would inspire the nation with fresh life and confidence."[499]

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[496] 6-7-1862, Ericsson to Fox, EPLOC.

[497] 19-7-1862, R. B. Forbes to Fox, Part 1, Letterbook, Forbes Papers, L.O.C. Fox replied with some annoyance. "If our Boston people are going to make terms for gold, they will see the work go to New York and Phila. The last bid for engines from Boston was 40% higher than the two latter places. We have ordered a board to go on and examine the cause of the delay in Carey' s engines on board the Housatonic. Somebody is trifling, and whether it is our fault of Carey's I am most anxious to find out," 26-7-1862, Fox to R. B. Forbes, FP.

[498] 9-7-1862, Gregory to Smith, RG 19, Entry 1235.

[499] 24-7-1862, Ericsson to Fox, FP.

Perhaps Ericsson was referring to recent events in the West, if not the East. Here Welles had been pressing Secretary of War Stanton of the "importance of capturing Vicksburg and keeping open and unobstructed the Mississippi river"—an operation which would require a diversion of "a sufficient land force to cooperate with the Navy in taking and holding the place..." This, the Secretary of the Navy assured his colleague, was "a source of regret" for both of them since Vicksburg "keeps our Squadrons unemployed" from other duties.[500] Army-Navy cooperation, it was implied, was critical, especially in the West—where the most dramatic Union advances of the war had been made (as Lincoln recognised). Corinth, Mississippi was captured on 30 May. Memphis, Tennessee surrendered 6 June, following a climactic, though one-sided naval battle that morning between Confederate gunboats and Union Flag-Officer Charles Henry Davis' force of ironclads and rams, operating out of Cairo, Illinois. As Welles noted in his diary, "the army has fallen in love with the gunboats and wants them in every creek."[501] Flag-Officer Farragut had meanwhile run his salt-water blockaders past Vicksburg's upper bluff batteries to join combined Union forces there.

Reports had been circulating, however, that the Confederate States Navy was rapidly completing another ironclad-ram up the Yazoo River, just north of Vicksburg. "We must seek this great danger before it hunts us", Commander H. H. Bell nervously wrote in his diary in early June.[502] A reconnaissance in force, consisting of the ironclad-gunboat *Carondelet*, the ram *Queen of the West* and the paddle-wheel gunboat *Tyler*, finally went in search of the C.S.S. *Arkansas*. But unlike at New Orleans, the Confederates had managed to finish their ironclad just in time. Early on the morning of 15 July, the *Arkansas* ran into this probe. Caught off-guard, the Union vessels turned about to warn the rest of the combined Union fleet. A running gun battle ensued in which the *Arkansas*

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[500] 29-7-1862, Welles to Stanton, WP.
[501] Entry dated 10-10-1862, Beale, *Diary*, 1: 167.
[502] Entry dated 6-6-1862, *ORN*, Series 1, Volume 18, 708.

quickly disabled the *Carondelet*, driving her aground, and then chased the remaining Union gunboats into the Mississippi. There her captain, Isaac Brown, "approached the Federal fleet—a forest of masts and smoke-stacks—ships, rams, iron-clads, and other gun-boats on the left side, and ordinary river steamers and bomb-vessels on the right."[503] Due to extensive damage to her smokestack (which reduced her draught and speed), the *Arkansas* could not ram. Instead she blasted her way through the combined Union squadrons which did not have their steam up, inflicting damage in every direction, and receiving pummelling hits in turn. At last the Confederate ironclad reached shelter beneath the guns at Vicksburg, a battered but powerful boost to moral there and across the South. Immediately there was talk of sending her, upon repairs, to retake New Orleans single-handed if need be.[504]

Farragut was outraged. At sunset a sortie was made to sink the *Arkansas* below Vicksburg, but driven off under heavy fire in the approaching darkness. An 11-inch shot penetrated the ram's casemate at short-range, however, disabling the engine, killing two and wounding three more. "This single shot caused also a very serious leak," Brown wrote, "destroyed all the contents of the dispensary...and, passing through the opposite bulwarks, lodged between the wood-work and the armor."[505] Nevertheless, the mere presence of a single Confederate ironclad had again completely upset Union strategy. Farragut reported to Welles his "deep mortification...that, notwithstanding my prediction to the contrary, the iron-clad ram Arkansas has at length made her appearance, and taken

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[503] Isaac Brown, "The Confederate Gun-Boat Arkansas", in Robert Underwood Johnson and Clarence Clough Buel (eds.), *Battles and Leaders of the Civil War*, 4 vols. (Edison: Castle Books, 1956, reprint of 1884-88 original series), 3: 575. His official report lists "4 or more ironclad vessels, 2 heavy sloops of war, 4 gunboats, and 7 or 8 rams," 15-7-1862, Brown to Mallory, *ORN*, Series 1, Vol. 19, 64.

[504] *Ibid.* Brown reported 10 killed and 15 wounded on the *Arkansas*; half his remaining crew were exhausted from the overpowering heat of the engine room. For Southern moral, see Confederate Major-General Earl Van Dorn's enthusiastic telegrams to President Jefferson Davis, 15- and 16-7-1862, *ORN*, Series 1, Vol. 19, 65.

[505] Brown, "The Confederate Gun-Boat Arkansas", *Battles and Leaders*, 3: 577. This must have been fired by the steam sloop U.S.S. *Oneida*, which mounted two 11-inch Dahlgren pivots; see 16-7-1862, Commander S. Phillips Lee to Farragut, *ORN*, Series 1, Vol. 19, 27. As Brown described his ironclad later that night "We are much cut up, out pilot house mashed, and some ugly places through our armor," 15-7-1862, Brown to Flag-Officer William F. Lynch, *ORN*, Series 1, Volume 19, 70.

us all by the surprise."[506] Davis preferred waiting to attack the *Arkansas* until after she was prepared and moved away from the protection of Vicksburg's guns; Farragut wished to attack before her repairs could be completed. Rising sickness, falling river levels, shrinking coal supplies, uncertainty of army reinforcements against Vicksburg, and the damage to morale by prolonging tensions over the ram were other considerations. At any rate, an ill-coordinated attempt to sink her on 22 July with the new ironclad gunboat U.S.S. *Essex* also proved ineffective.[507] Welles could only assert by telegram three days later that the rebel ironclad "must be destroyed at all hazards", and on 2 August wrote to Farragut "that the escape of this vessel and the attending circumstances have been the cause of serious mortification to the Department and the country. It is an absolute necessity that the neglect or apparent neglect of the squadron on that occasion should be wiped out by the capture or destruction of the *Arkansas*, which I trust will have been effected before this reaches you."[508] By that time, however, Farragut had already withdrawn his fleet back to New Orleans in disgust. The army was too sick to stay and moved off to Baton Rouge; and as long as the Confederate ironclad remained before Vicksburg, the city could not be taken. Welles and Stanton might have blamed one another with equal success.[509]

What finally destroyed the *Arkansas* was her own mechanical breakdown. Forced to assist in a Confederate attack on Union forces at Baton Rouge without full repairs, her starboard engine failed—after a 300 mile journey, within sight of Baton Rouge—and the *Arkansas* ran hard aground. As Federal warships approached, the ram was scuttled. But the lesson of her example was undeniable. The North could not win the war as long as Confederate ironclads could be built in shallow waters and launched to threaten Union

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[506] 17-7-1862, Farragut to Welles, *ORN*, Series 1, Vol. 19, 4.
[507] See 17-7-1862, Davis to Farragut, *ORN*, Series 1, Vol. 19, 9-10; 18-7-1862, Farragut to Davis, *ORN*, Series 1, Vol. 19, 13.
[508] 25-7-1862, Welles to Farragut and Davis, telegram, *ORN*, Series 1, Vol. 19, 36; 2-8-1862, Welles to Farragut (and Davis), *ORN*, Series 1, Vol. 19, 5-7.
[509] Beale, *Diary*, 1: 71-2; also 30-7-1862, Welles to his wife, Mary, WP.

gunboats penetrating into the South. Just as the *Monitor* and the *Passaic*-class follow-ons were needed to protect the Atlantic blockade, from European threats on the outside and Confederate ones within, so would even lighter-draft ironclads of superior armour-crushing armament and impregnability be needed to bolster Union combined-operations in the West.[510] Until then the North was as much on the strategic defensive there as it was again in the East.[511]

There were political side-effects as well. "Ram Fever" was growing in the North as newspapers spread reports and rumours of new Confederate ironclads under construction all over the South. "Merrimac No. 2" was ready at Richmond, while the English blockade-runner *Fingal* was being converted into a powerful armoured ram at Savannah, after delivering a precious supply of arms and munitions. But the Secretary of the Navy correctly surmised it was unlikely these were suitable for offensive operations. "In the mean time the sensationalists will get up exciting alarms and terrify the public into distrust and denunciation of the Navy Department."[512] This was important, since public trust in the government was a necessary precondition for public support of the Civil War—one whose nature would soon radically transform, as Welles learned two days

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[510] In Barnard's opinion, however, quantity—and speed of construction—was perhaps more important than quality. "To build a regular iron clad gun boat is a long job", he wrote to Fox. "Might we not, as they did on the Mississippi, and as the Confederates have done [on the James], improvise for this service by simply taking river steamers or our present gun boats and giving the iron shields[?] If the vessel is to be confined to river operations it is not of much consequence that she has not seagoing qualities," 19-7-1862, Barnard to Fox, FP.

[511] 19-8-1862, Welles to Farragut, WP Even if Union warships were freed from supporting the Army of the Potomac on the James River to bolster Farragut instead, Welles could only advise Stanton if "Newport News is to be held by the Army... that half a dozen 200 lb. Rifled Parrott guns be mounted there, as means to assist in keeping blockaded the Iron Clad vessels now building at Richmond," 29-8-1862, Welles to Stanton, WP.

[512] 10-8-1862, Beale, Diary, 1: 72. "Not but that the Rebels may get up a formidable affair—may injure some of our vessels, and do harm," Welles wrote to his wife. "The child might be born—might crawl into the oven, &c., &c., When the Iron monster crawls into New York harbor, destroys all the shipping, burns the city, the scare will have been consummated. There are a great many people in this world who like to despair with them... It is good for such to read the sensational articles in the N. York papers," 13-8-1862, Welles to his wife, WP.

before the *Arkansas* burst out onto the Mississippi; Lincoln was ready to issue a preliminary Emancipation Proclamation.[513]

It was therefore under these circumstances of the summer of 1862 that John Ericsson again addressed a letter to the nation's Chief Executive. The famed engineer-inventor positively endorsed "Mr. Rafael's repeating rifle", which he could authoritatively pronounce was "free from those imperfections which invariably defeat the usefulness of such contrivances." Technology drove tactics, and therefore strategy. Warfare, in fact, was becoming more efficient. Perhaps attrition could be avoided, if not 'radical mobilisation':

> The time has come, Mr. President, when our cause will have to be sustained not by numbers, but by superior weapons. By a proper application of mechanical devises alone will you be able with absolute certainty to destroy the enemies of the Union. Such is the inferiority of the Southern States in a mechanical point of view, that it is susceptible of demonstration that, if you apply our mechanical resources to the fullest extent, you can destroy the enemy without enlisting another man.[514]

Ericsson, however, was about to be taken at his word again. As with the *Virginia* at Hampton Roads, the *Arkansas* on the Mississippi only increased public pressure upon the Navy, and therefore upon its veritable "Chief of Operations", Fox.[515] As in March, the Assistant Secretary in August turned to Ericsson for help in preventing similar debacles from recurring. But history could not repeat itself exactly; the circumstances had changed. In March, Ericsson's only pre-occupation was with the six *Passaic*-monitors, mounting 15-inch guns. Now, in the hot new climate of crisis, he was already committed to providing plans for another four Passaics, and two of the huge ocean-going monitors

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[513] See Beale, *Diary*, 1: 70-1.
[514] 2-8-1862, Ericsson to Lincoln, LP. The "repeating rifle" was in fact a machine-gun. See also Robert V. Bruce, *Lincoln and the Tools of War* (Urbana: University of Illinois Press, 1989), 208-11.
[515] See 16-8-1862, and 20-8-1862, Fox to Welles, WP; also John D. Hayes, " 'Captain Fox—*He* is the Navy Department' ", *U.S. Naval Institute Proceedings*, Vol. 91, No. 9 (1965).

he had dreamed of even before the *Monitor*'s ironclad duel with the *Virginia*. Fox began with the usual flattery. "I feel that we should have more of your vessels, nothing that has been presented approaches them in value", he wrote Ericsson "The *Galena* and *Ironsides* are the work of a blacksmith; the *Monitor* a piece of delicate, perfect mechanism." This turned to a straightforward appeal:

> Your associates have nearly five millions worth of work, and the public whom we all serve, expect other work to be scattered. For yourself with your patriotic impulses the establishment of your system must be your greatest reward. People incapable of making one of your ships are begging, beseeching and demanding one. We propose to advertise say for a class of vessels like the big Monitor, Quintard's vessels, and the new Monitors to be built on the Atlantic or Western Waters; will you help us by furnishing drawings &c with the present royalty for the small ones, and say $10,000 each for the big ships? I am most anxious to see Monitors on the Mississippi...Shall we advertise and rely upon you? This seems the only way since we cannot have the entire use of your brains exclusively. I have thought about the matter deeply and have come to the conclusion that your boats only can give us the Mississippi...If you say yes, we will go ahead at once and the credit belongs entirely to you.[516]

Suggested here was not just one but two more distinct classes of monitor-ironclad, of ten and six feet drafts. Ericsson would supply the plans but other contractors would construct them beyond his direct or even indirect supervision. This was ambitious and risky. The specifications for such complicated vessels would potentially have to be furnished in even greater detail in Ericsson's absence. They would also preferably be supplied at once, if possible, and in greater numbers to separate private firms—and sub-contractors—across the country. Nor were the new monitors the only response by the Union Navy to the events of the summer. On the same day, 5 August, that Fox wrote to Ericsson above, Welles announced to Dahlgren "the Department is about contracting for more double-ended Gunboats, say fifteen," in addition to the four Navy-built double-

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[516] 5-8-1862, Fox to Ericsson, EPPA.

turreted ironclads, and a new class of "screw Gunboats".[517] This meant all these shipbuilding efforts would be likely competing against one another for mobilizing, but limited national resources—especially manpower.

This last was turning into a serious consideration. Even though Ericsson the next day indeed wrote Fox to "advertise as soon as you deem proper for more vessels and count on my assistance, pay or no pay" labour gangs on the *Passaic* monitors could no longer be worked night and day "during this warm season", and double gangs of men were no longer possible. "Such is the pressure produced by the Government work that we cannot fill up our day gangs much less work the double system." How then would this affect Ericsson's other pressing concern: the supply of 15-inch guns? "Can you not by employing all the makers at Pittsburgh, West Point and Boston obtain a supply?" he asked. "It will be nothing short of national disgrace if we are forced into protracted contest with the rebel craft when we ought to sink them as soon as engaged."[518]

National conscription only made matters worse, and threatened, as Ericsson wrote to Welles, to "put a stop to the work on the Iron Clad Navy." Half the workmen involved would be lost to the draft, while also "depriving us of the leaders of gangs and hands trained to particular work..." Ericsson had already taken the initiative of preserving this vital, specialised workforce by contacting "the owners of the rolling mills now employed in the manufacture of our Armor and other plating, as also the builders of vessels and machinery, to make out accurate lists of the names of the men employed on the Government work, with a view of obtaining exemption from drafting for these men." But this, he informed the Secretary, was respectfully not intended to commit or embarrassment the Department:

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[517] 5-8-1862, Welles to Dahlgren, RG 74, Entry 16.
[518] 6-8-1862, Ericsson to Fox, EPLOC.

> It is not for me to urge the imperative necessity of your prompt action in this matter, nor would it become me to set up an argument to prove, that a man drafted to pursue rebels or digging trenches, does not contribute more effectually to the defence of the nation than the toiling laborer who heats and clenches the rivets of the Armor intended to resist hostile shot.

Though this was in fact precisely what Ericsson *was* arguing, nevertheless he concluded by pointing out to Welles "that the instant you obtain exemption from military foe men employed on the national vessels, new life and vigor will be infused into our building yards. Skilful and good men in great numbers will at once seek work on the Iron Clads."[519] Gregory too, after reporting to Welles on 9 August "that the Contractors are making every possible exertion to fulfil their obligations in good faith", felt it "proper to call your attention to the consequences a draft of the Militia." Skilled labourers simply could not be replaced. "So great has been the demand, particularly for Iron Workers," Gregory observed, "that the Contractors have not been able at any time to procure as many as they required."[520]

Nevertheless, that August Fox continued with his scheme for building two new classes of monitors. The Navy Department was under stress.[521] Ericsson's answer of the 6th he wrote was "a loyal one and such as I counted upon". Fox wasted no time in making out his order: "10 feet gives us the main part of the Mississippi most of the year; to be sure 6 would be better, and I trust you will turn over in your brain a six foot invulnerable 11 knot boat, and we will bring it out so soon as you brain gets a little rest. In the meantime we must have some 10 foot Monitors out west."[522] Even more extraordinary, Ericsson replied he would send "a general plan of a swift and powerful Monitor Ram for the

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519 7-8-1862, Ericsson to Welles, EPLOC. See also 20-10-1862, Ericsson to Brigadier-General C. P. Buckingham, EPLOC, enclosing a list of draftees he wished exempt from the Pennsylvania State militia. "These men are of the greatest importance and without them the rolling mill has had to stop."

520 9-8-1862, Gregory to Welles, RG 19, Entry 1235.

521 See 13-8-1862, Welles to his wife, and 20-8-1862, Fox to Welles, WP.

522 8-8-1862, Fox to Ericsson, EPLOC.

Mississippi, of 10 feet draught" within *two days*. But his efforts could not be single-handed. The Assistant Secretary must procure exemption from the draft of everyone employed building such ironclads. "If you cannot," he warned "the country must then look to its soldiers alone for protection, for a long time to come."[523] Fox, however, was still dazzled at the level of protection Ericsson was offering. True to his word, the plans for the improved, swift monitor drawing 10 feet arrived within days. To Stimers Fox wrote:

> The advertisement (required by law) will be sent to day, and every shop capable of doing the work, shall have one, both here and on the western waters. I was surprised to find the royalty upon Ericsson's brain was divided amongst associates. We threw work so far as we could, into his hands to reward him for his success, but I should have preferred that the pre-eminent skill which has characterized him should have been devoted directly to our cause. However his answer to my letter and his generous offer without price is noble, and if Congress do not do him justice, the country will.

Fox was also "delighted" Ericsson was proceeding with the ultra light-draft monitors next. "It is all we require to complete our series." Yet Stimers' concerns that the contracts might be let to unqualified firms promising more than they could deliver Fox answered could not be avoided. "We must advertise by law: there is no help for it, but we can confine the work to bona fide workers." He was able to promise, on the other hand, "that the men who are working on boilers &c. for us will be immediately discharged whenever they are drafted."[524]

After meeting with Ericsson again in New York on 15 August Fox reported to Welles that the first improved monitor, the *Passaic*, would be launched on the 30th, followed by another two weeks later. He expected three to be ready by the end of October, "a

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[523] 9-8-1862, Ericsson to Fox, FP.
[524] 13-8-1862, Fox to Stimers, FP.

favorable time to go South." In the meantime Ericsson's work was being "driven all night. Even one inch plates cannot be furnished fast enough."[525] But there was comparatively less zeal for Ericsson to expect in return concerning the new monitors' armament. There were plenty of reasons to move cautiously than otherwise, Dahlgren argued, even suggesting Ericsson resort to mounting the longer 15-inch Rodman (Army) guns in the new turrets to save time. This of course Ericsson found "impracticable" and too late in any case. Dahlgren then noted the "great difficulty however in procuring the fabrication of such guns at all, and whether they shall prove reliable or not when made, remains to be seen." There was, after all, only one prototype of this calibre in existence. Even his 11-inch gun was in 1854 "considered too heavy to be allowed as a gun of the Navy—and was not admitted until I went to sea in the Plymouth (1857-1858) and proved practically that the gun was manageable." Could Ericsson 'practically prove' a class of ordnance two and half times' heavier without a trial? Could manufacturers be persuaded "to encounter the risk" of casting them?[526] The immediate concerns of the Civil War seemed to weigh against their adoption.

What ultimately tipped the scales in favour of procuring 15-inch smoothbores for the monitors, however—despite the difficulties; despite the risks—was the recurring influence of European concerns. "The Nation cannot afford to sacrifice the prestige which will attend a perfectly successful first trial of our system", Ericsson explained to Dahlgren. If the guns for the second monitor were delayed, Ericsson felt it better to "put only one XV inch gun into each", rather than none at all, "well convinced that with only one of the large guns in each vessel we shall be able to destroy all rebel craft[,] inspire a wholesome dread in Rebeldom[,] and prove to foreign powers that we can punish

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[525] 16-8-1862, and 20-8-1862, Fox to Welles, WP.
[526] 23-8-1862, Dahlgren to Ericsson, EPLOC.

(Top) "Target 57", a solid 5-inch thick rolled iron plate imported from John Brown & Co., Sheffield, backed by 18 inches of wood and an inner 1-inch plate, and packed against a solid bank of clay. Dahlgren was eager to test his 11-inch gun with increased charges against good English armour. (RG 74, Entry 98)

(Left) Shattered 4½- and 8-inch thick imported English and French plates; a 15-inch shot is still embedded in the far plate. (Washington Navy Yard, author's collection)

Rear-Admiral
John A. Dahlgren

(Naval Historical Center website)

intermeddling."[527] That same day, the Second Battle of Bull Run (or "Second Manassas") had begun, ending with the defeat of the Union Army of Virginia under General John Pope by General Thomas "Stonewall" Jackson and Lee's combined forces on 30 August. On 5 September Lee took advantage of the Federal retreat into Washington's defences to invade Maryland, which he hoped would then be 'free' to secede also. A campaign on Northern soil would spare the rich Shenandoah Valley of further pillaging, feed the Confederate Army of Northern Virginia on enemy harvests, and force McClellan's Army of the Potomac, back up from the Peninsula, to fight its own desperate battle. A victory on Northern soil would then demoralize the Union still further and encourage European powers to offer mediation on the basis of a permanent separation of the United States.[528]

Doubt and stress in the Department of the Navy turned to pessimism and panic. As Lee struck out from the Virginia, Fox wrote to Stimers that Dahlgren's recent test against an inclined target representing the *Passaic* class monitor's deck had proven its weakness. It also supported Dahlgren's claims since the battle of Hampton Roads that "30 lbs. of powder makes the 11 in. a terrible weapon." Perhaps Ericsson should accept that the 15-inch guns were unrealistic and unnecessary after all? "Give us two monitors and the *Ironsides*, and we will make Jeff Davis unhappy," Fox dolefully concluded, "though now he seems to have every thing his own way, and darker days are coming."[529] The Union needed a victory, and apparently only the Navy could supply one, but where? Richmond and Vicksburg defied combined Federal arms; there was only one major target-city left in the South, of little practical military value but conceivably as important morally if not

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[527] 29-8-1862, Ericsson to Dahlgren, EPLOC.

[528] See McPherson, *Battle Cry of Freedom*, 534-5. 3-9-1862, 4-9-1862, and 8-9-1862, Lee to Jefferson Davis, *ORA*, Series 1, Vol. 29, 590-2, and 600.

[529] 5-9-1862, Fox to Stimers, FP. See also 1-9-1862, telegram, Dahlgren to Fox, RG 45, Letters Rec'd. Dahlgren himself regarded the *New Ironsides* as "a clumsy attempt at an iron clad..." The original *Monitor*'s turret, however, he was convinced "would not long stand battering with XI in. shot," *Memoirs*, 377, 381.

strategically to the Union cause; where the Navy might strike a blow with minimal support from the hapless U.S. Army: Charleston. This was where the great rebellion began, and where British interests most visibly touched the South in the form of blockade-running.[530] Seward therefore implored the Navy to attack Charleston, "his remedy for all evils," Fox complained to his wife, Virginia.[531]

Yet it was to avoid further internal Navy disputes that Stimers responded to Fox's forecast of "darker days" with his own preference for Dahlgren's 11-inch gun—with 30lbs. of powder—"for present purposes". "New and untried guns in our new system of vessels which in reality have yet to make their name to the satisfaction of our Naval officers have all along made me anxious", he confessed.[532] Realising his own convictions had become perilously isolated, John Ericsson, however, characteristically struck back. "I cannot yet give up the idea of having one big gun in the *Passaic*'s turret", he wrote to Fox on 8 September, enclosing a copy of his reply to Dahlgren, whose "trial just made fully corroborates my views." This reaction may have seemed strange, but in fact Ericsson set out to counter-discredit Dahlgren before the Assistant Secretary. Hence, the *Passaic*-deck target-test Ericsson found "very interesting as it exposes the fallacy of inclined armor," he wrote to Dahlgren:

> I hope you will lose no time in making trials that have a direct bearing on the question of the resisting power of the decks of our impregnable fleet. 15° is an angle at which no competent Commander will ever permit his deck to be struck, excepting by spent balls. I need not point out the fact that to be struck at an

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[530] See 9-9-1862, Fox to Farragut, *ORN*, Series 1, Vo. 19, 184-5. Fox expected the "first new monitor will be ready October 1; others will come out during the month. Their first strike must be Charleston, where all the munitions go for the use of the rebels." Mobile would have to wait; Farragut's forces were too weak. "It is a dark time for us just now, and the country asks for another naval victory, but my opinion is that wood has taken risk enough, and that iron will be the next affair."

[531] 6-9-1862, Gustavus to Virginia L. Woodbury Fox, FP.

[532] 6-9-1862, Stimers to Fox, FP.

> angle of 15° from a battery of the great altitude of 120 feet, a vessel must be within a distance of 160 yards.[533]

Yet Ericsson was also under enormous stress. "I am not surprised to learn that you are experiencing effects of over effort..." Griswold wrote to him. "No other person could have achieved what you have and lived through it."[534] When Ericsson was reprimanded for not hurrying up work on the *Passaic*, he lashed out at his old colleague, Thomas Rowland of the Continental Iron Works, for not accepting his assistant's request for an explanation for the delay.[535] In the meantime, Fox and Stimers pushed ahead on altering Ericsson's specifications for the new Harbor and River (*Canonicus*)-class monitors, despite his arguments. Deck armour would be increased to two-inches, Stimers reported, who was also hard at work to provide fresh copies of the updated plans to every contractor. A model had been prepared by the Chief Engineer, now General Inspector of the ironclads under construction, while Ericsson busied himself with the *Passaic*-monitors he was building, the *Dictator* and *Puritan*, and a design for an ultra light-draft monitor drawing six-feet. "Capt Ericsson and the Admiral [Gregory] are very much disappointed at the prospect of being compelled to send her out without at least one XV inch gun," Stimers added.[536]

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[533] 8-9-1862, Ericsson to Fox, FP. Ericsson's enclosed letter to Dahlgren is dated 3-9-1862. Dahlgren's diary entry of October 3, 1862 took some satisfaction in noting the obvious weakness of the original *Monitor*'s pilot-house. "How a man of such cleverness as Ericsson should commit the error of exposing a flat surface to direct blow is curious... This square box should have been a turret, too. Every Achilles, however, has his heel," *Memoirs*, 381. Nevertheless, Dahlgren eagerly accepted an opportunity to procure sample armour plates of British manufacture; certainly to test their resisting powers to his 11-inch gun, and perhaps also prove that the foreign threat—Ericsson's trump card—could be met without resorting to monitor-platforms for 15-inch ordnance; see 18-9-1862, Welles to Dahlgren, RG 74, Entry 16, Box 4, and 25-9-1862, Dahlgren to Welles, RG 45, Letters Rec'd.

[534] 8-9-1862, Griswold to Ericsson, EPLOC.

[535] 15-9-1862, Ericsson to Rowland, EPLOC. This came hard on the heels of Rowland capturing front-page headlines (with a portrait-illustration) of the 6-9-1862 *Harper's Weekly*, as builder of the original *Monitor*, with contracts for the *Onondaga*, *Puritan*, three of the Passaics, and three more of their turrets for others. See also 8-11-1862, *Scientific American*, 297.

[536] 12-9-1862, Stimers to Fox, FP.

By this time, the fate of the Union seemed to be "drifting on a troubled sea and God only Knows where", as one Navy Department insider wrote to John Rodgers.[537] Matters again depended on McClellan's Army of the Potomac, which was at last facing against Lee and Jackson's combined forces at Sharpsburg, Maryland, near Antietam Creek. The great battle of the 17th subsequently managed to compel Lee to withdraw back across the Potomac, thereby ending the invasion. But while the Union had not suffered another defeat, neither was it altogether certain it had achieved a clear victory. The Army of Northern Virginia was left intact—and even allowed to escape without Federal pursuit. The war would continue. A dismayed President Lincoln nevertheless saw an opportunity to come forth with his Emancipation Proclamation, which he did on 22 September 1862. The war would become more total.

Fox knew the nation could not afford to wait much longer for the new monitors. How many would *definitely* be ready by 1 November, he asked Stimers? "Look at this by comparing them with all past experience, so that our movements may not be defeated by overestimating; as is almost always the case." Furthermore, a more total war would undoubtedly require a wider, more comprehensive spread of Federal monitors. "Capt. E. must not give up the light draft boats" he persisted. "Our series is not complete without them." The Assistant Secretary had already told the Department and "the iron folks here and out West" that advertisements for their construction, based on new plans from the redoubtable John Ericsson, would soon be placed. His message for Ericsson (which he understood Stimers would read to his new neighbour that day) was that Fox had "every confidence" in him to "furnish such plans"—and in fact, could rely on no one else to do so.[538]

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[537] 16-9-1862, F. A. Murray to Rodgers, RFP.
[538] 20-9-1862, Fox to Stimers, FP.

JOHN BULL'S NEUTRALITY—THE GUARDIAN OF CIVILIZATION IN FULL PLAY.—(*See* RUSSELL'S *Letter*, ROEBUCK'S *Speech*, &c., &c.)

Published on the same day.

"NOT UP TO TIME;"

Or, Interference would be very Welcome.

But Gregory's report to Lenthall of 22 September revealed a much more restrained optimism from those of the summer. According to the various government inspectors, "in general, the progress of the work under construction is satisfactory."[539] Four days later the bubble burst. Welles, reports in hand, wrote directly to Gregory of the "necessity for having half a dozen of these vessels completed by the middle of November, so as to use them during the fair weather which may then be expected, and the great results to be hoped for from their character..." The Admiral in charge must therefore make "extraordinary exertions for their early completion." Rowland should be pressed—hard—"throwing his whole energies into the works, giving daily the influence of his presence among the workmen, especially in the case of the *Catskill*, so far behind hand." The state of the experimental, lightly-armoured *Keokuk* was even more shocking. No extra hours were put into her construction, despite the "assurances of zeal and perseverance" originally made to the Department by her contractor. Henceforth, the Secretary demanded that weekly reports list the number of workmen employed upon each ironclad, and the amount of overtime work given. By mid-November he specified the *Passaic*, *Patapsco*, *Montauk*, *Nahant*, *Catskill*, *Weehawken*, and *Keokuk* should be sent to sea.[540]

Even as Welles called upon Gregory to lead the ironclad contractors' in a renewed sense of patriotic energy, other elements within the Union Navy were anything but optimistic. Captain Percival Drayton was a prime example. "I am quite willing to take the *Passaic* and do what I can to reduce Charleston or any other place that it may be thought proper to attack", he wrote a comrade on the 25th. "I doubt the fact of any of these vessels being very seaworthy, but some one must decide the point," he added, "and I might as well do it as any one else." Beneath this exterior indifference, however, Drayton was a sharp

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[539] 22-9-1862, Gregory to Lenthall, RG 19, Entry 1235.
[540] 26-9-1862, Welles to Gregory, WP.

activist in his own right. The monitors were obviously flawed. "As it seems that a good deal of ballast will be required to bring these vessels down to a proper draft, I think it a great folly that it should not be effected by means of water, which could be removed to lighten the draft in case of getting ashore." He also opined that "the decks will be found to be very easily penetrated, this however can be left for the first action to decide..."[541] Pessimism, like its opposite, had a decisive way of reinforcing itself in the Civil War. Fox on the same day questioned Stimers with exasperation why Ericsson would need 100 tons of extra shot in the *Passaic*. "If it is to bring her down, it might as well have gone on the decks, where the system is weak." In the same breath he reminded Stimers that the *Passaic* and her sisters were daily expected. "When Congress adjourned last session, we promised them Charleston on assembling. I am afraid the Monitors will be behind hand."[542]

Two days later, Fox again wrote to Ericsson. Though he was intrigued with the engineer-inventor's most recent suggestion of "Flying Artillery", or "Monitors on shore"-tanks, for the troubled Union Army, Ericsson "must recollect one thing—your brain is more engaged to us to a certain extent." Virtually in exchange, the Assistant Secretary promised that 15-inch guns were only days away. Could not Ericsson in the meantime "give them a stir-up, there at Greenpoint, so as to enable us to settle the question of iron clads against stone forts, before Congress meets"?[543] Fox also confessed his doubts over the *Passaic*-monitors' forward ballast, which he presumed was "unavoidable, or your extraordinary skill and ingenuity would not have been forced to adopt it."[544] This read more unmistakably like a suggestion of mistake on Ericsson's part, however. Perhaps Fox (if not also Ericsson) was becoming careless as well as nervous. At any rate, Stimers

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[541] Enclosed in 25-9-1862, Drayton to Fox, FP. Captain C. H. Copeland was possibly shipbuilder Charles W. Copland.
[542] 25-9-1862, Fox to Stimers, FP.
[543] 27-9-1862, Fox to Ericsson, EPPA.
[544] *Ibid.*

assured him that Ericsson was indeed "hard at the 6 foot vessels, but you know he will never show me a plan until he has worked it out."[545] At this, Fox became only more perturbed—and outspoken—to Stimers.[546]

Ericsson, no longer able to ignore the latest crisis of faith from naval professionals, responded to Fox on 29 September. The Union Navy did not have to worry about his ideas for technologically rescuing the Army, since the "great moving cause no longer exists, besides which I am now fairly up to my ears in the construction of the big ships and completion of the small ones, to say nothing of the Shallow water boat." As for proper ballast, this was a matter of careful calculation and choice. Ericsson could quickly change his calculations; but dispensing with ballast at all "would utterly destroy the needed accommodation within the forward part of the vessels", or require "additional time and money". Giving the vessel finer lines would also give it great speed as well as reduce the ballast, but then the Navy would have to "put up with uncomfortable quarters". The choice, of course, was up to Fox, Ericsson challenged—if ballast was such a critical issue. "The best sailing vessels require ballast, why should not also the most comfortable Monitor vessels be allowed to carry it?"[547] Ericsson then summoned Stimers, reading to him his reply to Fox and explaining it with "great force...So much so that I am not certain that we can improve matters at present in these vessels", Stimers wrote to Fox. Evidently, Ericsson also rammed home another vital issue to the young Chief Engineer (as well as redirecting pressure back to the Bureau of Ordnance): the number of *weapons* that would be available, as much as the number of *weapons-platforms*, would determine when operations could commence against Charleston. 15-inch guns would unquestionably wreak greater damage against the brickwork of Fort Sumter than Dahlgren's preferred 11-inchers. Likewise, the "fewer the number of vessels

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[545] 25-9-1862, Stimers to Fox, RG 19, Entry 1250.
[546] 27-9-1862, Fox to Stimers, FP.
[547] 29-9-1862, Ericsson to Fox, also 12-12-1862, Ericsson to Fox, FP.

which carry these guns the less will be the target for the enemy to fire at. Four vessels will carry eight of them. Will you have more than that?"[548]

Nor was Ericsson finished. "I infer from expressions used by Chief Engineer Stimers at our interview last evening that you attribute the ballasting the *Monitor* fleet to mistake or miscalculations on my part" he wrote to Fox. "Should this inference be correct I can no longer afford to deal with the subject in the playful manner I did in my letter of yesterday":

> I must state then emphatically that not one pound of ballast above what I calculated upon will have to be put into these vessels nor would I dispense with this ballast for the price of the whole fleet. The question of stability of vessels built on the new system is one of serious importance and has engaged more of my attention than any other part of the subject.

Because of the monitors' low freeboard at sea, plunging into waves that washed over the deck, it would "not answer to increase the thickness of the deck and armor indiscriminately without putting weight below to balance the heavy top." Ericsson, unlike Drayton, Fox, or even Stimers, had pre-calculated the unusual metacentric height of the *Passaic* monitors in direct relation to their seakeeping abilities, not just their protection against possible enemy fire.[549] He then repeated his argument "that the number of 15 inch guns rather than the number of vessels will decide your success against the Stone forts."[550]

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[548] 29-9-1862, Stimers to Fox, FP.
[549] 30-9-1862, Ericsson to Fox, EPLOC.
[550] *Ibid.*

IV. The *Passaic* crisis

The belated presence of the U.S.S. *New Ironsides* meanwhile did little to reassure Union naval leaders—at least at first. Although commissioned on 21 August her trial run from Philadelphia to Hampton Roads proved so unsatisfactory that she spent another month back in Philadelphia for an emergency refitting. On 4 October 1862 Commodore Smith wrote to her builders, Merrick & Sons, that "$100,000 of the reservations" was being paid by the Navy; "the balance will be held for further trial of the ship, especially in regard to speed." This was guaranteed to be 9½ knots, drawing 15 feet, and carrying eight days' of coal for steaming at that speed.[551] Those attributes, however, would never be met. Perhaps this was the result of numerous changes made to her while under construction (as with many of the monitors). For the Union's only armoured broadside-frigate to see service in the Civil War these included, significantly, the addition of armoured bulkheads—sealing off the battery forward and aft to prevent raking fire—an armoured pilot-house (foolishly mounted *behind* the smokestack), 4-inch thick gunport shutters, and an increase of armament (and therefore carriages, ammunition, and handling crew) from a battery of 9- to 11-inch Dahlgrens.[552] At any rate, Smith was low on mercy. As long as the additions in weight did not affect her draft, the builders of the *New Ironsides* would be deducted $500 per day "from contract over time".[553]

By 6 October, however, Chief Engineer Stimers reported to Fox that Ericsson's plans for an ultra light-draft monitor were ready. "Of course", he wrote, "it is quite original

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[551] 4-10-1862, Smith to Merrick & Sons, RG 45, Entry 464, AD, Box 51.
[552] See Roberts, *New Ironsides*, 21-2; 25-6; 29-30; also Canney, *The Ironclads*, 18. Roberts' attempted excuse of "tradition" for the placement of the pilot-house does not make it any less practical in a *steam-powered* warship. The designer of *New Ironsides*, Barnabas H. Bartol, had made several critical errors.
[553] 4-10-1862, Smith to Merrick & Sons, RG 45, Entry 464, AD, Box 51. The ship was under trial for ninety days after being turned over to the Navy. See Roberts, *New Ironsides*, 37-8. See also 15-10-1862, Smith to Captain Thomas Turner, RG 45, Entry 464, AD, Box 51. *New Ironsides* steered so badly as to prevent any greater speed than 6½ knots because her poorly-designed hull gave little power to the rudder—critically exposed above the waterline unless the ship was weighted down with extra coal. See also 31-10-1862, Turner to Dahlgren, DP.

differing from all other plans yet proposed and surpassing them all just as much as it differs from them."[554] Two days later Ericsson transmitted the general specifications to Welles—who had finally seen the original *Monitor*, refitting at the Washington Navy Yard, just three days before.[555] Among other features, the new monitors would have a long wooden-hull overhang over an inner, submerged iron one, staggered twin-screws, and two layers of ½-inch plating for deck armour. "The turret, pilot house, turret machinery, blowers, blower engines, Worthington pumps, and impregnable smoke pipe" Ericsson noted would "precisely as the *Passaic* and the other U.S. Gunboats of her class." This would make those portions of the new monitor-class at least as well-protected as the *Canonicus*-class as well. A uniform design would furthermore allow greater ease of construction for new and experienced constructors, who could be supplied with veritable duplicates of existing plans—and thereby save mass-production drafting time. As Ericsson pointed out, "the plans and general specifications thus furnished will no doubt furnish the bidders to make their estimates of cost more particularly since the whole of the turret work is now accurately defined by precise working drawings."[556] Stimers, however, could only write Fox that Ericsson expected him to provide the drawings for the various monitors. Managing ironclad production on a mass scale, involving multiple firms across the country, was a further, unprecedented responsibility. Simple oversights, assumptions, and lack of coordination between Bureaus could quickly lead to disaster. Chief Engineer King, Stimers noted to Fox, was in Pittsburg superintending the construction of two *Canonicus* monitors; "he has now orders to superintend the *Manayunk* building at Pittsburg with its machinery building at Brownsville—50 miles away—and the two vessels *Tippecanoe* and *Catawba* building at Cincinnati, O." Personal rivalries could also come into play. To ease the burden on King, Stimers recommended an associate, Chief Engineer Elbridge Lawton, serving on the frigate

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[554] 6-10-1862, Stimers to Fox, FP.
[555] 5-10-1862, Gideon to Virginia Welles, WP.
[556] 8-10-1862, Ericsson to Welles, EPLOC.

U.S.S. *Mississippi*; "but I have an idea that the Chief of the Bureau of Engineering would do nothing which he would consider as favoring in any way Mr. Lawton." Extra superintendents and inspectors would also need extra assistants and draftsmen.[557] In fact what was needed was a separate *infrastructure*, if not a distinct Bureau.

But Stimers was already presuming too much, and Fox let him know it. The Assistant Secretary had noticed he was openly assuring contractors who were already behind additional compensation. "All my letters to you are unofficial and you must not use them in your official dispatches", he reproached. For any monitor that could be ready at Hampton Roads by 15 November the Secretary would probably "remit all forfeitures", and this was a better strategy for urging the builders if nothing else.[558] He meanwhile continued to face doubts over the new monitors and their rapid completion. Drayton, commander of the first *Passaic*, reported his ship "does not seem to be much further completed than ten days back and I doubt if even now any time can be appointed for her delivery to the yard." Only by making a short trip in the *Passaic* herself, wrote Drayton, would the Assistant Secretary "get a clear idea of the capabilities for sea service of this class, which I doubt your being able to obtain in any other way." Although Drayton himself had never been to sea in a monitor, how could Ericsson possibly assure the Navy of its investment? Worse than being pessimistic, perhaps, Drayton was fatalistic. "The Monitors have undoubtedly many faults but it seems difficult to correct them without falling into others equally bad..."[559] Fox could not ignore his officers' opinions; if possible, he would go to New York and try out the *Passaic* for himself, he informed Stimers. He was not confident about the monitors' ventilation, "which is of the greatest importance", and there were "some other points that I desire to examine carefully." Against the misgivings of his naval professionals, however, Fox had to respectfully weigh

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[557] 6-10-1862, Stimers to Fox, FP.
[558] 8-10-1862, Fox to Stimers, FP.
[559] 7-10-1862, Drayton to Fox, FP.

Ericsson's assertions to the contrary. The engineer-inventor's bristling though convincing explanation of ballast vs. top-weights in the *Passaic* was but a recent example. "If such is the case", he admitted to Stimers, "of course there is no answer to it."[560]

Still, the matter of ironclads appearing at all, nevermind their actual effectiveness, was paramount. "We must have six vessels on the 20th November and we will astonish the world," he pressed Stimers. "Time slips away." Though hesitant firms were at last taking on more of the *Canonicus* contracts, some preferred to bid for the light-drafts instead, others demanded more time and money, and how could the Government actually refuse any offer in a period of national emergency? Ericsson's matter of fact observations on light-draft construction Fox likewise regarded as "most admirable but the conclusion is dreadful, viz: that if Delamater was not employed he would produce 3 in 90 days."[561] Gregory could at least report to Lenthall and Isherwood on 6 October that the contractors had noticeably increased their efforts, though these were combined with Stimers' talk of "extra compensation to the Contractors under certain circumstances..."[562] Two days later, the Admiral could also assure Welles' that his urgent appeal of 26 September had taken effect; the monitor *Nahant* was launched with the *Montauk* to follow the next day; *Keokuk* was swarming with an "ample force of men" to complete her.[563] The results themselves seemed encouraging. Having "minutely examined the exterior" of the *Nahant* just before her launch, Stimers let Gregory know he was "proud of her as a specimen of our proficiency in this country in the art of iron ship building."[564]

Flush with this sentiment, Stimers candidly addressed Fox's worries on the 9th. The Chief Engineer was "quite grieved" to find he had overstepped his bounds in his last official

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[560] 7-10-1862, Fox to Stimers, FP.
[561] *Ibid.* See also 5-10-1862, Ericsson to Fox, FP.
[562] 6-10-1862, Gregory to Isherwood; 6-10-1862, Gregory to Lenthall, RG 19, Entry 1235.
[563] 8-10-1862, Gregory to Welles, RG 19, Entry 1235.
[564] 8-10-1862, Stimers to Gregory, RG 19, Entry 1250.

report. "Hereafter you may consider everything you write me as private and unofficial unless it has your rank attached to the signature and I will make no official reference to any but such letters." As for why contractors could obviously work harder at some moments than others, Stimers reminded Fox that for private industry the work was "a matter of business". To "hurry work faster than is ordinarily done by energetic men adds to its cost." The Government-contracted firms would of course secure as many labourers as they needed, provided the Government was willing to pay 50 per cent more for them than any other builder. Furthermore, "if you pay this to new hands you must also increase the wage of the old to an equal amount." The same principles applied to materials, especially iron. To get as much as required, as quickly as possible, would simply cost more. "Therefore, if a Military exigency has arisen which makes it important that you have these ships before you can get them by driving them up to the limit, of what may be termed, commercial energy, you must pay an additional sum." How could the Government hold contractors responsible for labour problems which the war—and hence the Government—exacerbated with extraordinary demands? Contracts were made under ideal conditions; and New York was a world away from the front-line environment of Washington. Hence, Stimers advised Fox that "[$5,000] per vessel would make a difference of a month in the time of a ship in the present condition of the *Sangamon* or the *Weehawken*":

> Ericsson has given orders to expend that amount in increased wages upon the power vessel, he cares not whether it will be refunded or not, he will expend it, but at Jersey City they must be satisfied that it will be returned before they will expend it even though they pretend to me that they will do it, and really, you cannot blame them for they could easily ruin themselves if they worked without care of the cost and they do not know as well as Ericsson how much they will be in or out of pocket when all bills are settled.

This was behind Stimers' earlier suggestion to the contractors. If Gregory were instructed to *guarantee* up to $5,000, then night and Sunday work would also (and only) be considered 'cast-iron'. "Then we could drive matters". The war was thus forcing Lincoln's administration to choose between time and money; and recent events made the fear of its political collapse seem more immediately a matter of the former—as a military defeat—rather than the latter—in the form of national bankruptcy. These were tough decisions for a junior officer to make, caught between the opposing needs of two crushing realities—as reflected by the alternative interests of these two groups, the Government and private industry. "I am almost frightened at times when I reflect upon the enormous amounts which are now being expended by the Government under my general inspection," Stimers confided. "I fell like the man who walks the tight rope across a rapid, the slightest deviation from a direct line is immediate ruin, not only in acts of common honesty but also in the advice I give and the suggestions I make to the Government."[565]

Naval professionals were likewise proving quick to detect any imperfections which, however quickly resolved, could still leave a seriously complicated mechanism inoperable. "Today I was made unhappy by learning from Capt. Drayton that the ports of his Iron Clad the *Passaic* are but 17 inches in diameter whilst the 200 pounder for the Turret is 27 inches", Commodore Paulding wrote to Welles on 15 October. This was "a discrepancy that Ericsson should have provided for & which to remedy will occasion delay." It seemed unlikely that the ironclads would go south until December, he predicted. "It grieves me that it is so but we are helpless in the hands of the Iron men

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[565] 9-10-1862, Stimers to Fox, FP. The most detailed study of Stimers' role in the Union ironclad program remains that of Dana Wegner, "Alban C. Stimers and the Office of the General Inspector of Ironclads, 1862-1864", State University of New York at Oneonta M.A. thesis, 1979; see also William H. Roberts' recent *Civil War Ironclads: The U.S. Navy and Industrial Mobilization* (Baltimore: The John Hopkins University Press, 2002).

[though] I believe they are doing all they can."[566] Smith too wrote to Ericsson only to "caution...against a failure" regarding his new monitors, whose seakeeping properties he still did not trust, but by mid-October he had learned to keep a respectable distance from the harried engineer-inventor.[567] A bigger problem was administrative, he informed Welles. Contractors' bills and payments were made to and from various Bureaus including his own (Yards & Docks) and should be consolidated into the Bureau of Ship Construction & Repair.[568]

The Department reacted to these concerns optimistically, however, continually driving efforts forward—even as the British Cabinet debated mediation. They were other practical details to attend to, Welles reminded Gregory. Could the *Nahant* be brought to New York to receive her 15-inch gun? How *were* the ordnance arrangements for each of the ironclads coming along? Were pilots familiar with the Southern coast and ports being obtained for the monitors? Was the Admiral even making sure that "enough tallow or slush [was] put on board each of them to slush decks and turrets in action"? Two more *Canonicus* monitors were contracted in the meantime, to be put under his superintendence, the *Saugus* and *Oneota*.[569] Gregory replied to Welles that the "Ordnance Arrangements for the Vessels are in advance of other matters."[570] The *Passaic*'s gunports, originally designed in the uncertain days of spring to accommodate an experimental 13-inch smoothbore, were too small for the barrel of the new 15-inch gun to protrude. Rather than increase the openings, however, Ericsson saw this development as a further tactical improvement. As long as the 15-inch shot itself could pass through the 17-inch diameter opening the gun was essentially effective—and protected even more since its muzzle could not be shot off. But could such a massive cannon be fired *inside* a

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[566] 15-10-1862, Paulding to Welles, WP.
[567] 17-10-1862, Smith to Ericsson, EPLOC.
[568] Welles concurred. 21-10-1862, Smith to Welles, RG 45, Letters Rec'd.; 22-10-1862, Welles to Smith, RG 71, Entry 5, Box 423.
[569] 17-10-1862, Welles to Gregory, WP.
[570] 20-10-1862, Gregory to Welles, RG 19, Entry 1235.

turret? Again, Ericsson's calculated 'guess' said so, and only awaited a proper test. 16 October arrived, yet where was the 15-inch Dahlgren? "It is indispensable to ascertain at once if my plan is practicable of firing through a small hole without passing the muzzle of the gun through the turret", he complained to Fox.[571] When it finally did arrive, was mounted, and duly tested on board the *Passaic* on the 28th, the results were controversial, indicative once more of the wider—yet personal—tensions that existed within the Union Navy's ironclad program.

Captain Drayton's report to Rear-Admiral Gregory was, perhaps not surprisingly, anything but flattering to Ericsson and stressed his system's defects. With only a fifteen pound blank charge the 15-inch Dahlgren had filled the turret "with smoke to a degree almost suffocating and which was so for a very disagreeably long period, although the two hatches were off which could not have been the case in action." Under a greater charge and solid shot the smoke was less, "but the concussion such that I should not think that a heavier charge could have been used with safety to the guns crew, it seems that the compressor was not on this occasion properly screwed up, which permitted a recoil that a time prevented further trial, which was also the case with the eleven inch gun which was fired with a solid shot and fifteen pounds of powder." Though Drayton admitted the "trial is not considered as finally settling the question," it had nevertheless satisfied him "that it will not be practicable to use the guns inside of the turret." Rather than write off the idea, Gregory's notational remark on the copy of Drayton's report forwarded to the Bureau of Ordnance stated Drayton's remarks "are premature—arrangements are in progress for the purposes stated."[572]

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[571] 16-10-1862, Ericsson to Fox, EPLOC.
[572] 29-10-1862, Drayton to Gregory, RG 74, Entry 22, Box 1.

Ericsson, on the other hand, stressed in his telegram to Fox that the "trial of the fifteen inch Gun yesterday by no means proves that it may not be fired inside of the Port Hole." He was fitting an iron "muzzle piece" around the end of the barrel inside the turret to control the discharge-smoke better. More significantly to him, it only took two men to "run the large Gun in and out"—an amazing technical advance in the annals of heavy armaments for warships.[573] The next day, 30 October, Ericsson's defensive optimism turned to a virulent counterattack on Drayton and the other scoffers present at the trial, including Commander John Worden of the original *Monitor*. "The trial of Tuesday was made at my request for the sole purpose of firing the large gun without the muzzle piece", he explained to Fox. "It was the first time such an enormous gun had been fired on board of a vessel." As for the noise produced, he pointed out, many experienced witnesses considered it *less* than an open air 11-inch Dahlgren firing. "The smoke which entered the turret was heavy but passed down by suction of the blowers in about 10 seconds." The muzzle box would reduce it further. Widening the port, Ericsson vigorously objected to "until engineering expedients have been exhausted". Even larger port-holes would only require larger shutters, or, if the turret was rotated while reloading, increase the chances of shot entering the turret, killing the crew, and destroying the guns—which were themselves in precious short supply.[574]

Worse still, Gregory and Stimers had prematurely allowed the press to cover the experimental trial. As a result, wrote Ericsson, "a very damaging account appeared in the [New York] *Herald* of yesterday":

> A few more such statements will relieve Jef [sic] Davis of his present anxiety about the Iron Clads that threaten his strongholds. Our rivals across the water will also be greatly relieved. Should

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[573] 29-10-1862, telegram, Ericsson to Fox, RG 74, Entry 22, Box 1.
[574] 30-10-1862, Ericsson to Fox, FP. Welles still had his doubts, sending Fox, Dahlgren and Smith to New York to witness further tests; see Beale, *Diary*, 1: 179, entry dated 1-11-1862.

> our guns not be capable of sustaining more than one third of the proper charge demanded by the magnitude of the gun and weight of Shot, it is a misfortune we ought to keep to ourselves.[575]

Ericsson was even more "greatly annoyed" by his critics, if not embarrassed for the country, than he let on. The day *before* the *Passaic*'s initial 15-inch gun test, an unsigned essay that he submitted appeared in the *New York Herald*, on "American and English Iron-Clads". Here, Ericsson attempted to place the Union's ironclad program into sharper, yet broader, patriotic focus. The historic events at Hampton Roads had succeeded in frightening Great Britain away from all thoughts of troubling the United States. In response Armstrong had created a gun that could penetrate the armour of the strongest ironclad. "This reassuring fact was forthwith made known through the press, and John Bull took a long breath, quite sure that the Yankees, after all, had no hit upon anything better than the *Warrior*." But the isolated British targets were misleading, not representative of an American monitor's amour-shelf, supported by the full flat deck resting in water. "In return for the attention which our proceedings receive from the English," Ericsson informed *Herald* readers, "we are carefully looking into what they are doing with their iron-clads." *Warrior*'s armour protection scheme was well know, and weak—the 15-inch guns of the new Passaic monitors would put the *Warrior* and her sisters on the run, which the *Dictator* would then hunt down on the open ocean. Much more heavily armoured on her sides and turret than anything the British were planning, Ericsson concluded there were "substantial reasons for believing the *Dictator* will prove a dictator."[576]

Ericsson's simplistic emphasis on foreign affairs drew some attention away from the period of comparative quiet which followed Antietam. "But little is being done just at

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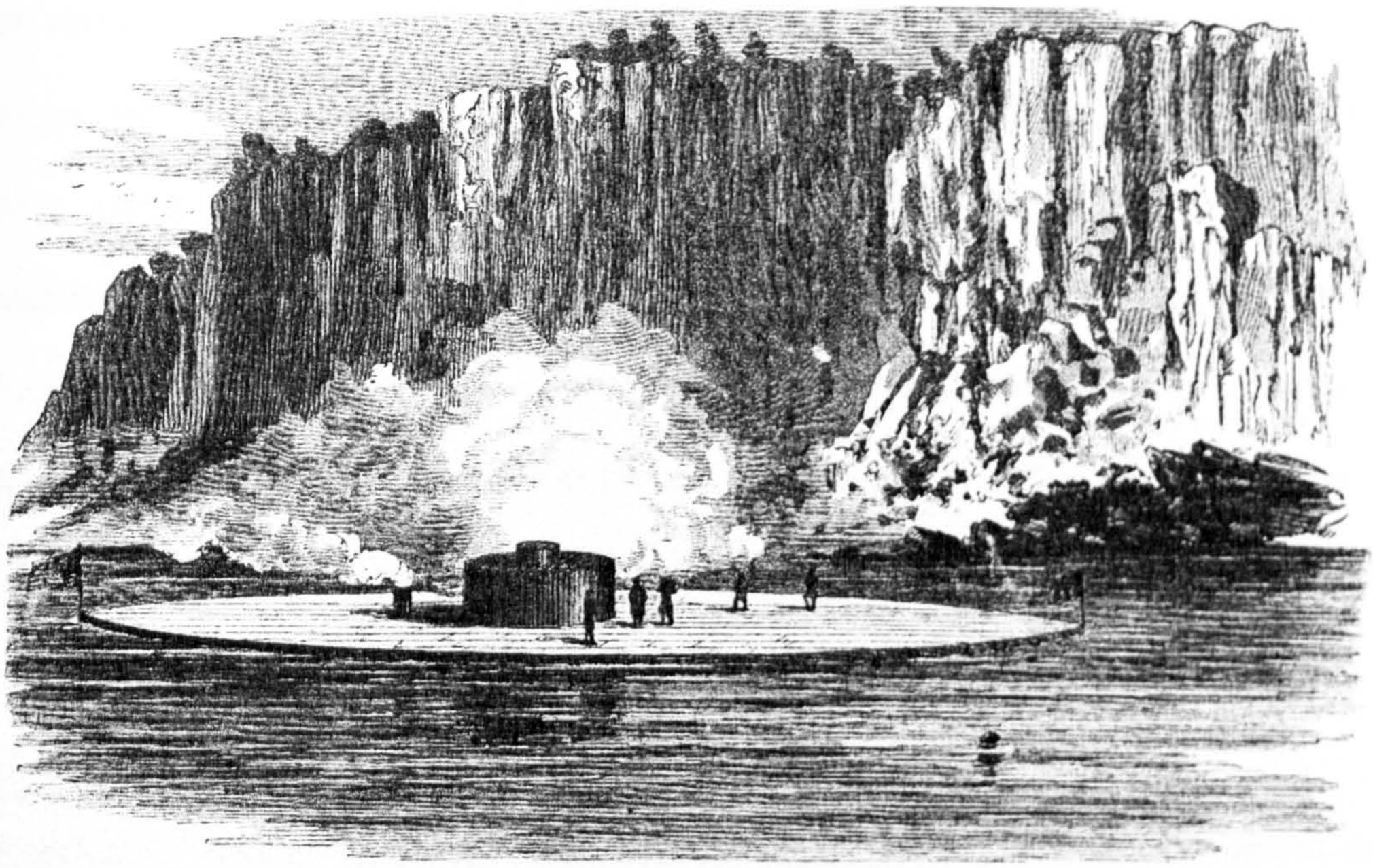
[575] 30-10-1862, Ericsson to Fox, FP. Welles subsequently reprimanded Gregory about reporters "giving accounts of the trial trips of our new iron clad steamers and making public much information which they should not," citing a General Order of the Department dated April 22, 1862; 1-11-1862, Welles to Gregory, WP. See also 12-12-1862, U.S. Navy General Order on secrecy, copy found in RG 45, Entry 328.

[576] 27-10-1862, *New York Herald.*



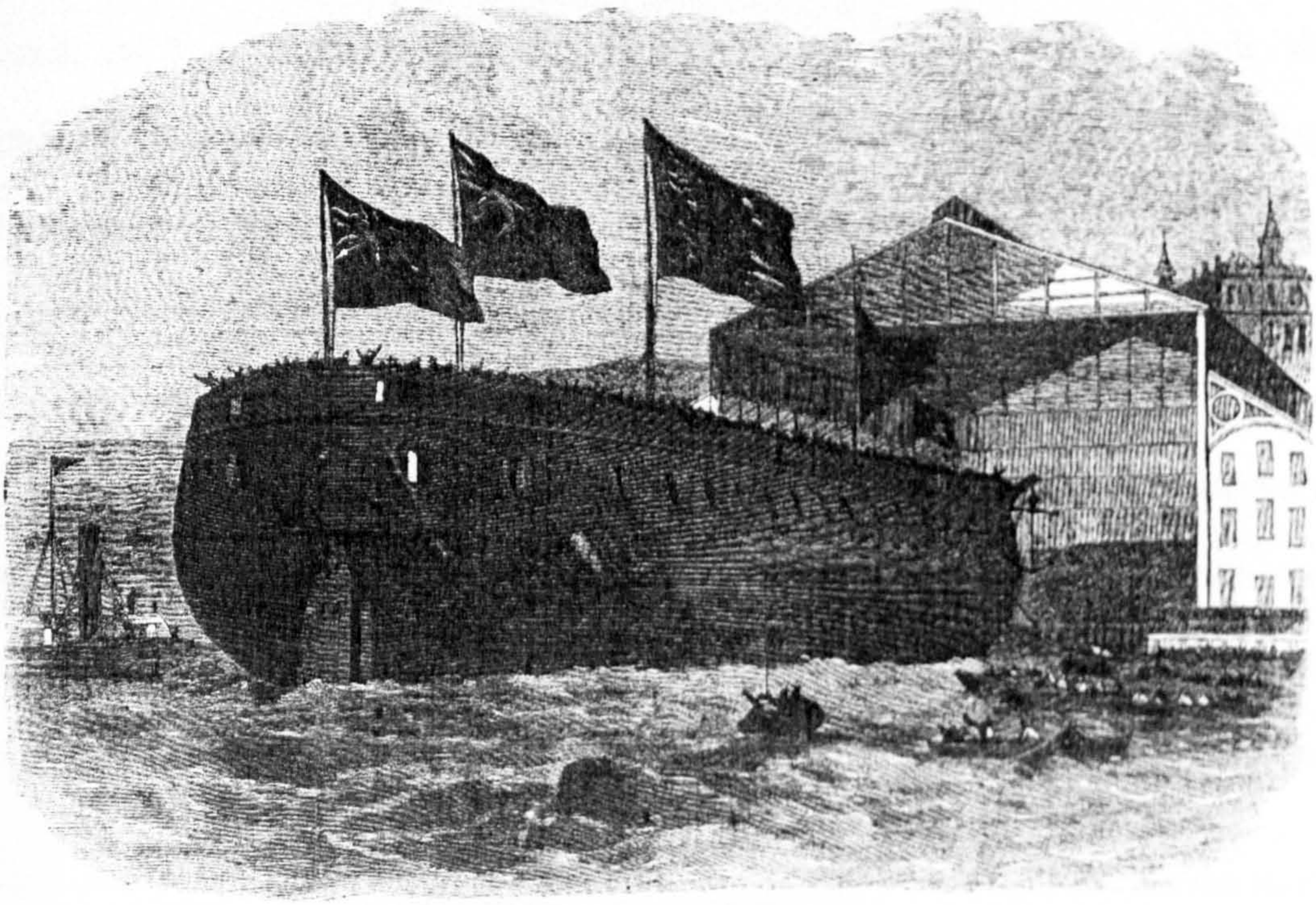
THE "PASSAIC" TRYING HER LARGE GUN AT THE PALISADES, NOVEMBER 15, 1862.

IRON-CLADS.

WE publish herewith, by way of contrast, the launch of the British IRON-CLAD "CALEDONIA," which took place at Woolwich Dock-yard on 24th October last; and likewise a picture of the experiment made on Saturday, November 15, with the great gun of the "PASSAIC," in the Hudson River.

The *Caledonia* was commenced in the year 1859 as a 90-gun wooden ship. After the battle of the *Merrimac* and *Cumberland* the British Admiralty abandoned the construction of wooden vessels, and the *Caledonia* was altered to become an iron-clad 84-gun vessel. She is 273 feet long, 59 feet beam, 20 feet hold, and 4125 tons. She is to carry two 110-pound Armstrong guns on the upper deck; on the main deck eight 110-pound Armstrongs and twenty-four 68-pounders. Her masts and bowsprit are to be of iron; and the hull of the vessel above the water-line, and for a short distance below it, is to be plated with 4½ inch iron. It will be seen that the only deviation from the old system adopted thus far by the British Admiralty consists in the plating of their vessels. They are still huge monsters, soaring high above the water, and presenting a target which the most inexperienced gunner could not miss; and which, at a proper distance, a 600-pound ball would penetrate as easily as card-board.

The recent trial trip of the *Passaic* was made to ascertain whether the great 15-inch gun could be fired without having the muzzle protrude from the turret. The previous trip showed that without some new contrivance the gun could not be fired within the turret without endangering the lives of the gunners by the explosion. To allow the muz-



LAUNCH OF THE BRITISH IRON-CLAD SCREW FRIGATE "CALEDONIA," THIRTY-FOUR GUNS, AT WOOLWICH, OCTOBER 24, 1862.

this time by either the Army or Navy, I regret to say" Welles wrote to his son on 2 November 1862. "All the contractors are greatly behind their time in completing & delivering their vessels thereby deranging all plans, and while I perhaps am the person most wronged and disappointed, the country will be very likely to blame me most for delay or neglect."[577] Indeed, it seemed a long time since the Union had achieved any notable successes in the Civil War—and the Congressional elections were at hand in November. Meanwhile, at sea the C.S.S. *Alabama* was wreaking havoc on Northern commerce. For this too Welles expected personal blame, rather than his colleague William Seward, whose policy towards Britain since the *Trent* Affair he felt was one of "meeting aggression with concession... to avoid hostilities, but to throw the labor of the conflict on the Navy if there was to be a war."[578]

The mounting national and international tensions of late 1862 had thus turned the cramped confines of the gun turret of the U.S.S. *Passaic* into a pressure-cooker. Ericsson and his engineers were under close and urgent scrutiny from the Navy to make their vaunted machines work as quickly and perfectly as possible. As a result, the unprecedented challenge of mounting a single 15-inch gun of 22 tons on a single ship, and making it fire in an enclosed space without deafening, concussing or smoking out the gun crew quickly had become indicative of the many deeper—and personal—issues at stake. Ericsson, for his part, considered the success of his ideas inevitable.[579] This included employment of an iron smoke-box around the 15-inch gun. "The experiment is simply a question of <u>strength</u>", he wrote to Fox. "I have employed ½ inch thick plate, not having been able to obtain heavier plate without losing too much time."[580] Time proved decisive, however. On the 15th the efficiency of the box in reducing smoke and

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[577] 2-11-1862, Welles to son, WP.
[578] 14-10-1862, Beale, *Diary*, 1: 172; also 10-10-1862, 165-6, 13- and 14-10-1862, 170-1. See also 10-10-1862, Seward to Welles, and 15-10-1862, Welles to Seward, WP.
[579] Success was also necessary; as Stimers pointed out to Fox, the 15-inch gun would have to utilize charges of more than 40 pounds to be effective against strongly-armoured targets, 10-11-1862, Stimers to Fox, FP.
[580] 9-11-1862, Ericsson to Fox, FP.

concussion was proven enough after three test-fires; Stimers then advised removing the muzzle ring to test it still further. The fourth shot ruptured the box.

At any rate, General Superintendent Rear-Admiral Gregory was satisfied with Ericsson's recent test-fire, reporting to Welles on 15 November that the "certainty of being able to use guns of that large calibre in my opinion [is] fully established."[581] The Secretary, having written to Gregory the same day that it was "very important that the *Passaic* should be at Hampton Roads on Saturday next", congratulated him in response to the news that it was "a continuation of the triumph of mechanical skill."[582] To Dahlgren, however, Gregory reported on 16 November that "the arrangements made by Capt. Ericsson...were not entirely successful as there was some damage done the box fitted round the port by the concussion..." But he agreed the test was nonetheless *indicative* that Ericsson would "perfect the [arrangements] in such manner as to answer the purpose effectually..."[583]

Drayton's assessment of the same day took Gregory's wavering to the other extreme. Although he admitted it was "practicable to fire the gun in the way proposed," he admitted to Dahlgren, it was "at the sacrifice of some convenience in loading and sighting." On the other hand, it would always be easier to drill out a port-hole larger than seventeen inches later if it was found necessary, than to fill it up. Nevertheless, the newspaper reports of the trial were "pretty much false, the fact being that the gun is not fired inside of the turret, but into a chamber attached to it, and in point of fact I have been right and not Mr. Ericsson from the start, as I always told him he could not fire the gun as it was when you were on board..." It was thus Drayton's suggestion to construct a smoke-box, not Ericsson's, and Drayton who urged that it be made strong enough, "which

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[581] 15-11-1862, Gregory to Welles, RG 19, Entry 1235.
[582] 15-11-1862, Welles to Gregory, RG 45, Entry 15; 17-11-1862, Welles to Gregory, WP.
[583] 16-11-1862, Gregory to Dahlgren, RG 19, Entry 1235.

it is difficult to make him do," he added sarcastically, "as his experience as a Swedish Artillery officer has taught him that there is no lateral escape from the muzzle, but that the gas goes straight ahead."[584]

Rodgers noted this discrepancy of attitudes to his wife: "Ericsson says make the box stronger and it will answer completely. Drayton doubts whether it can be made strong enough."[585] Unfortunately, so did one of Ericsson's reporters, who, according to Stimers, "expressed himself quite feely about the Naval Officers and did not show his complete report to the Capt., so that although nothing is published which can be objectionable to the Government there is an apparent discourtesy to a large number of officers which has caused a good deal of feeling and which makes the Admiral, Capt Drayton and Myself regret that we took the responsibility of permitting the reporters to accompany us."[586] Ericsson later attempted to trivialize the affair, yet with an unmistakable air of official denial.[587] The press, the Navy, and Ericsson; no one was willing to openly state there might be a civil-military relations issue over the monitors in the balance.

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[584] 16-11-1862, Drayton to Dahlgren, DP.
[585] 19-11-1862, John to Anne Rodgers, RFP.
[586] 20-11-1862, Stimers to Fox, FP.
[587] 26-11-1862, Ericsson to Fox, EPLOC.

V. Shifting ironclad confidence

Again, the wider circumstances of the Civil War put these diverse and often conflicting personal, working relationships into sharp relief. Exactly how would the Union ironclads be used when they were ready? Where would they strike? Or would they be used for strictly coastal and harbour defence after all? The subsequent discussions of their deployment were a matter of national policy: would the Navy assume the strategic defence with its ironclads or try to regain its initiative with them? When Rodgers bemoaned his initial refusal to be reassigned to one of the new monitor-ironclads—and off the stricken *Galena*—his inside contact at the Navy Department assured him on November 6 that "at this moment greater anxiety is felt about the 2nd *Merrimac* [the diminutive casemate ironclad-ram C.S.S. *Richmond*] than upon any other subject connected with the naval operations of the war, not excepting the '290' [the C.S.S. *Alabama*], when she is destroyed or blows herself up."[588] Hampton Roads, Fortress Monroe, and the recaptured base at Norfolk—and perhaps even Washington—were still considered far from secure; the memories of the *Virginia* and the *Arkansas* lingered, even as Rodgers in the *Galena* languored.

That same day, Captain Thomas Turner of the *New Ironsides* was even more fretful. No one seemed to understand the iron gun carriages provided for her powerful battery of sixteen 11-inch Dahlgren smoothbores, neither Dahlgren nor her builders, he complained to Rear Admiral Samuel P. Lee of the North Atlantic Blockading Squadron. Their recoil was so violent as to prevent a sustained fire, while the gundeck of the broadside-ironclad was not large enough to house the crews needed to work such heavy guns with traditional truck and tackle. Until that technical problem was fixed, or lighter ordnance substituted (which Turner preferred), the *New Ironsides* guarding Hampton Roads virtually had no

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[588] 6-11-1862, Murray to Rodgers, RFP.

armament. Her captain, in the meantime, wished his concerns formally reported to the Department "if any disaster should occur in the partially crippled condition of my ship—by which the enemy might inflict serious damage, or escape to the waters of the Chesapeake..."[589]

Even if the Union had an additional ironclad frigate in service, Welles apparently indicated he would like to see it stationed in New York harbour, "ready for sea".[590] The threat of the *Alabama*, and other fast, British-built Confederate cruisers always on the horizon, had caused considerable alarm in the big eastern port-cities. Deputations from the powerful New York Chamber of Commerce and the Governor pressured Welles to allocate at least one of the new ironclads for the permanent defence of their harbours from quick raids or humiliating demands for "tribute".[591] The Boston Board of Trade wrote: "In view of the recent reckless depredations of the piratical steamer *Alabama*, and her reported near proximity to our bay, and also the apparently well authenticated fact recently made public, that powerful steam rams are now partially constructed in England, to be used by the rebels in an attack on our principal cities on the Northern coast, added to an apprehension (by no means unfounded) that our country may suddenly be involved in a foreign war, it can not be regarded strange that this community should be pervaded by deep solicitude as to the absence of immediate means to make any adequate defense against an attack from either of the sources referred to." Though there were three forts, Warren, Independence, and Winthrop ready to accommodate 475 guns, only 153 were in place, "and none of these can be said to be of sufficiently large caliber to make a successful defense against an armor-plated steamship, especially if she should attempt to enter the harbor through Broad Sound." Although this form of defence was the

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[589] 6-11-1862, Turner to Lee, and 11-11-1862, Dahlgren to Welles, RG 45, Letters Rec'd. See also 2-11-1862, Dahlgren to Welles, RG 45, Letters Rec'd. At any rate, the U.S.S. *Monitor* had returned to Hampton Roads by the 15th.

[590] 10-11-1862, David Radly Field to Welles, WP.

[591] See 16-9-1862, telegram, Morgan to Welles, *ORN*, 1: 1, 475-6, and 8-11-1862, E. D. Morgan to Welles, *ORN* 1: 1, 539.

responsibility of the U.S. Army, its resources were obviously stretched, and the necessary ordnance would take more time. It was logical to the Board that, in the meantime, the Navy should fill the gap with a "floating battery". "We are not unaware of the embarrassment which the Government has suffered from the limited means of supplying ordnance in its great emergency, nor would we make the claims of Boston Harbor for protection unduly prominent, but you will pardon us if we suggest that, after a war of twenty months, the harbor of the third commercial city in the Union ought no longer to be allowed by its very weakness to invite the aggression of a desperate enemy." Boston therefore wanted the *Nahant*, which was finishing under Loring.[592] The next day, Welles was even informed by fellow Cabinet member, Secretary of the Treasury Salmon P. Chase, that the Governor and Port Collector of New York had called upon *him* in "reference to the defenses of that city." Chase could not resist the opportunity of blithely informing Welles that the "duty of providing such defenses on the water belongs appropriately to your Dept.", and that his own could provide two revenue steamers, if need be.[593]

Welles relented to Governor Morgan. Instead of the old sailing sloop *Savannah* (being used as a training ship), the converted multi-turret ironclad *Roanoke* would be placed under the command of Rear-Admiral Paulding for the defence of New York until another armoured man-of-war was ready.[594] But when Paulding inadvertently informed Hiram Barney, the New York Collector of Customs, that the *Passaic* was already ordered south,

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[592] 12-11-1862, Boston Board of Trade to Welles, *ORN*, 1: 1, 542-4. See also the deputation of the Boston Marine Society, 18-11-1862, to Welles, *ORN*, 1: 1, 547-8; and 14-11-1862, C. H. Marshall, Chairman of the New York City Chamber of Commerce, to Welles, requesting commissions to fit out private vessels to capture the *Alabama* "under promise of reward by citizens", *ORN*, 1: 1, 545.

[593] 13-11-1862, Chase to Welles, WP. See also 19-11-1862, Hiram Barney, New York Collector of Customs, to Welles, *ORN*, 1: 1, 548, who complained that since the *Passaic* was ordered south, and the *Roanoke* (according to Paulding) would not be ready for at least 60 days, he would utilise the armed revenue steamers to at least act as warning pickets, and reassure the local populace "that the naval authorities are ready to perform the duty which they have undertaken of destroying any hostile vessels which may possibly reach the harbor."

[594] See 17-11-1862, Morgan to Welles, WP; also *ORN*, 1: 1, 546-7; and 18-11-1862, Welles to Paulding, RG 45, Entry 328.

and that the *Roanoke* would not be ready for at least another sixty days, Welles was quickly told New York City would indeed utilise the armed revenue steamers, to at least act as warning pickets, and reassure its citizens "that the naval authorities are ready to perform the duty which they have undertaken of destroying any hostile vessels which may possibly reach the harbor." The next day, 20 November, Barney—with Morgan—telegraphed Welles they desired "the *Passaic* remain for the defense of this harbor until the *Montauk* is ready for that service."[595]

The control of Federal ironclads thus threatened to be pried out of the hands of the Navy Department in Washington. Moreover, an ironclad granted for the direct defence of one city would similarly oblige the Navy for every other. Were the nation's interests best served locally or not? Welles wasted no time in replying. It was, he acknowledged, "proper at all times to guard against danger, though it may not be imminent." Yet there was "seldom a day when there are not several Naval vessels at New York undergoing repairs," some of which would probably be "ready for instant service". The defences of New York were, at any rate, "much better provided for...so far as the Navy is concerned, than most of the places on our sea-board." Most crucially, the Secretary of the Navy specified:

> This is in no respect a maritime war, and the War Department has doubtless attended to the harbor defences. It can hardly be expected that the Navy Department should suspend active operations and divert vessels from their destination from merely apprehended dangers, or apprehended omission on the part of the Government or others, in regard to defences.[596]

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[595] 19-11-1862, Barney to Welles; 20-11-1862, telegram, Morgan and Barney to Welles; *ORN*, 1: 1, 548. Gregory meanwhile reported "a very large force employed" on the *Roanoke*, 22-11-1862, Gregory to Lenthall, RG 19, Entry 1235.
[596] 22-11-1862, Welles to Morgan, WP.

When John Forbes wrote from Boston on 19 November that people on the coast were "subject to spasmodic attacks of the Shakes—& just now our public [are] much concerned about the *Alabama*", Fox replied the same day as Welles he had no doubt such cruisers "can be kept out by our present forts." Besides, the *Alabama* was "doing a much business with less risk than attacking Boston."[597] What Fox had in mind for the monitors was a series of offensive strikes all along the southern coast, starting at Wilmington, then Charleston, possibly Savannah, and finally sweeping the Union tide of victory back into the Gulf of Mexico, where Farragut was waiting. To Rear Admiral Lee he almost cavalierly suggested on 7 November that it would be "a grand stroke to take a couple of steamers, tow these vessels down in good weather, and clean out Wilmington and its railroad connections." Indeed, he added: "Perhaps the forts would surrender if you got to the town."[598] Fox was even willing to offer $5,000 to any pilot familiar with the harbour, "of undaunted courage and great coolness", "if they take an ironclad to the town of Wilmington and back."[599] But these plans, he already knew, were reliant upon the Navy's ability to force enemy obstructions, as much the Union might rely upon them as well. Though Stimers reported to him on 10 November he had "Torpedoes men placed in hand", Gregory had his doubts that the monitors would have the necessary power to batter through obstructions with armoured rafts the way Ericsson and Stimers envisaged.[600] Even if the various obstructions could be overcome, and ropes avoided, would the forts surrender? Would the town?

In any event, troubles continued to plague the *Passaic* in the meantime. On her two-day maiden voyage to Hampton Roads her boilers suffered from poor construction and even worse management by her chief engineer. Shuttled back up to the Washington Navy

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[597] 19-11-1862, John Forbes to Fox; 22-11-1862, Fox to John Forbes; FP.
[598] 7-11-1862, Fox to Lee, *ORN* 1: 8, 203-4.
[599] 28-11-1862, Fox to George W. Blunt, *ORN*, 1: 8, 237. See also 26-11-1862, Welles to Lieutenant-Colonel Martin Burke, *ORN* 1: 8, 235.
[600] 10-11-1862, Stimers to Fox, FP; 13-11-1862, Gregory to Welles, RG 19, Entry 1235.

Yard, Isherwood himself was ordered by Fox to examine the cause. The Martin Boilers had been the Bureau Chief's suggestion. Drayton did not waste time complaining to Rear-Admiral Lee about Ericsson's injured ironclad, "owing to bad work and negligence"; while the Assistant Secretary, always the positive conciliator, assured Lee that although the "arrival of the *Passaic* was very discouraging," she would quickly be back in service. "We have learned something by the accident. Accident is a good teacher."[601]

Ericsson's mood, however, was anything but satisfied. Even though the *Montauk* was also ready, he was annoyed of her not being ordered out, "as the several officers found all sorts of things to do." Holes were being drilled into her decks for various fittings, making him uneasy. "One would think from the manner the Monitor fleet is viewed by your officers", he wrote to Fox, "that it must be intended for cruising and not for attacking and destroying the enemy."[602] It was little wonder that Rodgers was nervous of meeting the fiery and reclusive inventor, a sort of great and brooding volcano. "He is said to keep himself aloof from vulgar eyes, much in the manner of the great Mogul; and to offend generally those who gain admittance", he noted to his wife. "I think I can get on without receiving offense as I am neither captious nor touchy."[603] When Loring inquired on 15 December whether Ericsson was sure he had not omitted any extra details for the monitors which the Navy might require, the volcano burst. Additional fittings were not his responsibility, but Stimers'. "It is here that in order to please the several officers of the Gunboats I have invented and applied various contrivances such as bits, timber houses, chocks, flag staffs, auxiliary steering gear, holding down gear of hatches, Shot lifters and a variety of other similar contrivances but in no instance have I succeeded in

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[601] See 29-11-1862, Drayton to Turner; 3-12-1863, Drayton to Lee; 9-12-1863, Fox to Lee, *ORN*, 1: 8, 243; 269.
[602] 10-12-1862, Ericsson to Fox, FP.
[603] 7-12-1862, John to Anne Rodgers, RFP.

calling forth expressions of approbation." While the Government and general public seemed to appreciate his efforts, nothing had "so far given satisfaction to the commanding officers." Yet Ericsson had responded to their concerns—and the builders—within days, if not hours in most cases. "I politely offered the other day to send you a turret sight ready made," he pointed out to Loring, offended, "you have not even noticed my attention." What right did Loring or anyone have, therefore, to suggest any "neglect" on his part? The *Passaic*'s boilers were only the latest example. Ericsson expected more gratitude, respect—perhaps faith—by then. "I could show you that such herculean [sic] labor as I have performed in relation to the Monitor fleet is not on record in the history of engineering":

> Not one plan have you waited for essential to the prosecution of the work. Matters of detail unconnected with the vessel and machinery yourself and the Government Inspector should have looked after.
>
> I have repeatedly urged your sending some competent person to copy what was doing here if you desired to follow me in every thing. I now again urge this course.
>
> I will at once report the whole case to the Secretary of the Navy as I cannot permit blame to be fastened on me as my reward for almost superhuman exertions during the last seven months.[604]

But when Ericsson did complain to Fox, not Welles, the Assistant Secretary finally boiled over himself. Indeed, he could afford to be more forthright, in many ways, with Ericsson than with his fellow Union officers. It was for Ericsson to remember that Fox too was under stress because of the monitor-ironclads; from the officers, the contractors, and the bickering found at all levels over matters of technical detail which nonetheless threatened to derail the Union ironclad program unless *someone* proved willing to actually *fix* such problems as they occurred, and *everyone* was kept on track—which was not always a rewarding task either:

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[604] 16-12-1862, Ericsson to Loring, EPLOC.

> Being myself responsible that some twenty are now underway, and knowing that the exigencies of the public service did not permit experiments with the details, I have personally considerable at stake in the matter. It is a stake of reputation which is the greatest one that can be imposed. It is briefly whether I shall be considered an Ass or a very sensible man. I take this risk on these boats most cheerfully, having every confidence that your skill will work out successfully the perfection of all minor details.[605]

Ericsson was again mollified, to some extent, but seems to have missed Fox's wider point. Two weeks later, Ericsson finally acknowledged he was "more and more surprised at the course of this officer [Drayton] who seems bent on prejudicing everybody against the vessel under his command." Not only was Drayton's proclivity for criticism and despair unsuitable for the *Passaic*, it was severely infectious. In a state of civil war, perhaps it was even *treasonous*... Was this the type of officer the Union needed? In fact, Ericsson was prepared to show "by legal testimony" that it was Drayton who had "called on the Editor of *The* [*New York*] *World* and told him that the muzzle box had been torn to pieces and that the idea would prove an utter failure." This was a much weightier indictment than those against Rowland, the "overbearing" builder with his poor choice of foremen, or the various "incompetent" engineers of the monitors—assigned by Isherwood, the "malign" Chief of the Bureau of Steam Engineering; the man behind the monitors threatened (perhaps justly) to demand the replacement of the captains in command of the nation's most important, high-profile warships—*Ericsson's ironclads*:

> I trust the man may prove to be what you expect, certain it is however that he is discouraged by the slightest difficulty. I have found him on every occasion to give in on the first appearance of trouble. I will try to believe that it is <u>mechanical</u> difficulties alone that appall [sic] him.[606]

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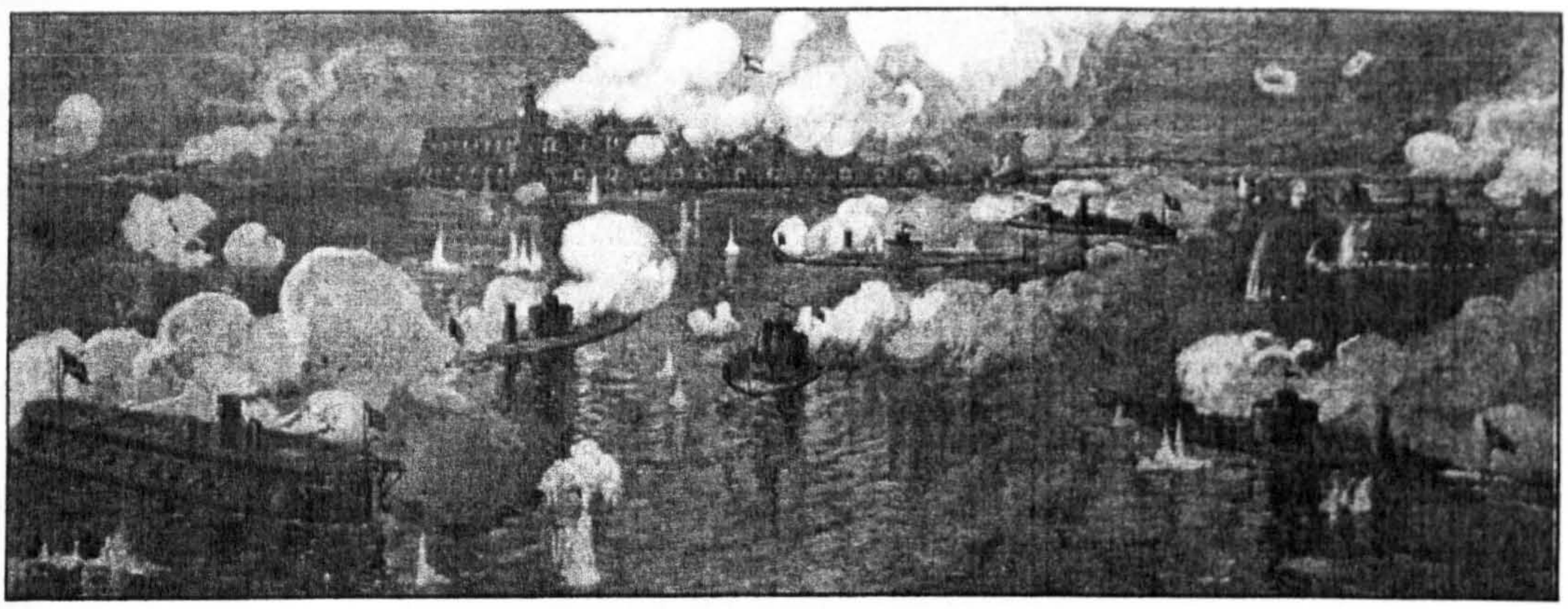
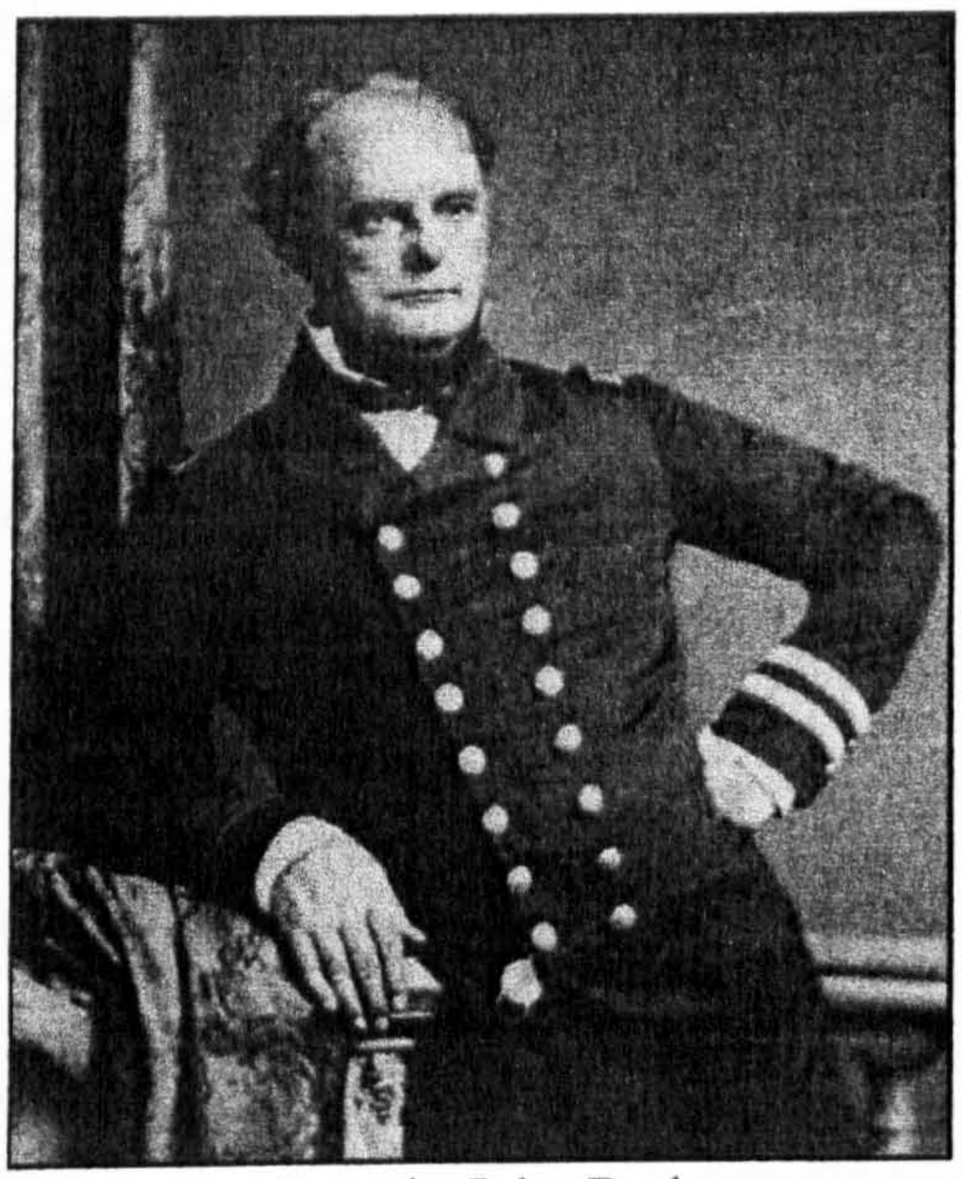
[605] 16-12-1862, Fox to Ericsson, FP.
[606] 30-12-1862, Ericsson to Fox, FP.



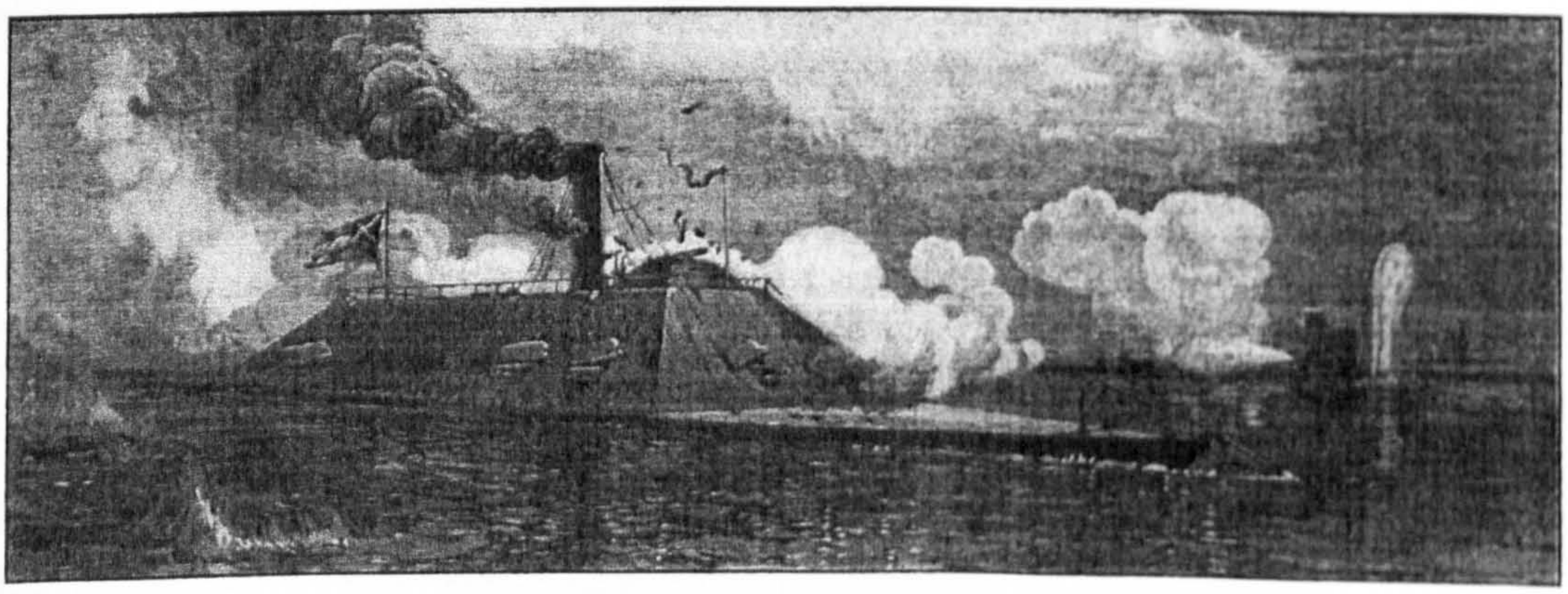


Captain John Rodgers

Captain Percival Drayton

(from William C. Davis, ed., *The Image of War: 1861-1865*)

Union monitor commanders were a sceptical breed. Their worst fears seemed to come true in the abortive attack against Charleston's combined defences (7 April 1863) when Rodgers in the lead monitor *Weehawken* reared before the line of obstructions, fearing torpedoes. Two months later, however, both he and his ship were redeemed when the C.S.S. *Atlanta* was brought to a speedy, crushing surrender on 17 June 1863. (Illustrations fromRobert Underwood Johnson and Clarence Clough Buel, eds., *Battles and Leaders of the Civil War*)



Fox again responded diplomatically. It was his job to do so. There was an important

distinction to be made between those who operated the ironclads and those who commanded (if not directed) them. Senior engineers in charge of the ships' engines could, should, and would be rather easily replaced when need be. "It is only necessary for you to give us an intimation in time, to have a change instantly made, as in the case of the *Passaic*," Fox confirmed. But the charge against Isherwood was more complicated, and the Assistant Secretary disapproved of "Mr. Stimers putting on to Isherwood's shoulders any 'malign influence' against the Monitor fleet." Isherwood was *not* the mastermind of an anti-monitor conspiracy; one of his Bureau's clerks assigned the engineers for the monitors, and these were then under Stimers' supervision, not the Engineer in Chief's. Once more, Fox reminded—and reassured—Ericsson: "I have shouldered this fleet, and I doubt if any one can stand in the way provided we are successful, of which I entertain no doubt." Complaints from officers he absolutely liked to hear of "because it teaches a lesson—Pride never does." Bickering, on the other hand, was inexcusable, even dangerous, in the Navy. "Mr. Stimers and Mr. Isherwood belong to a military family, and it is impossible for the former to talk openly about the latter, and the Officers tell me Stimers does, without laying himself liable to be called upon to prove all he says." If Ericsson, or Stimers, were to ever put Fox's professional loyalties to the test, *on the basis of patriotism*, he could assure them both there was no inherent conflict of his duty. "I have no friend in all this business except those who most earnestly and zealously work to defeat the public enemy," he wrote, "and all those who are banded together to work to the same end, should endeavor to do it with harmony."[607]

Perhaps more significantly, the monitors were at least being commissioned, at last becoming a reality, and already fulfilling their primary, original role. As Rodgers indicated to his wife on December 16th, the *Montauk*'s trial trip, "which I and Rowan George Rodgers were ordered to witness and take note upon", including the test-firing of

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[607] 30-12-1862, Fox to Ericsson, FP.

the 15-inch gun inside the turret, was "very satisfactory." Furthermore, "Capt. Lessoffsky[,] Russian Navy[,] with 2 other Russian officers were on board and very much impressed with the power of the gun."[608] Despite the setbacks and uncertainties of 1862, Rodgers contemplated the New Year with a sense of hope, and this was all that Ericsson, the Department, and Lincoln, asked. His new command, the monitor U.S.S. *Weehawken*, already needed a repair just before her departure south. "An accident happened to the machinery, whereby two of the cog wheels for moving the turret were damaged by having some of the teeth broken out", yet this could be easily mended, he wrote. Eager to be off, Rodgers was more than ready "to have a finger in humbling Sumpter [sic]." Indeed, the "garrison should be made to surrender without conditions..." Fanaticism and confidence went hand in hand. The Navy still expected victory, and its ironclads were the key. As for the threat posed by the "Merrimac No. 2" against Hampton Roads, Rodgers thought it possible that "when the iron clads are taken off to some pressing exigency...she will pitch in, and strike for Washington." But he would be "pleased" if she attacked before then. "I stood Fort Darling 3½ hours," he assured his wife, "and in less than that time the *Merrimac* will be chips."[609]

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[608] 16-12-1862, John to Anne Rodgers, RFP.
[609] 31-12-1862, John to Anne Rodgers, RFP.

VI. Regaining the strategic initiative?

Regaining the strategic initiative during the Civil War had by this time become an international issue for the Union as well. On 7 December, even as the Army of the Potomac, under the new command of General Ambrose Burnside, finally began to march against the Army of Northern Virginia—towards Fredericksburg—Seward stressed to the U.S. *Chargé d'Affaires* at St. Petersburg, Bayard Taylor: "Our great expedition assigned to Major General Banks has moved towards its destination, and it will soon be heard from. Our forces are clearing the valley of the Mississippi. Another army is pressing the insurgents in Virginia. Our iron-clad fleet is growing with rapidity, and it will soon reduce the last remaining insurgent port. The principal part of Tennessee is restored." It was the task of all U.S. consuls to constantly assure—and warn—"that any foreign power which think this people is ready to divide and destroy itself is mistaken, and that if any such state thinks the Union can be destroyed by interference from any foreign quarter, this belief is even still more erroneous." Taylor likewise replied on the 17th (before news arrived of the repulse of Burnside at Fredericksburg) that "nothing can do us so much damage abroad as inaction, either real or apparent." The intervention crisis following the news of Antietam and the Emancipation Proclamation had temporarily passed, and Taylor hoped "that the restoration of confidence...will not again suffer a relapse."[610] The Union had to demonstrate strength as well as resolve—against the Confederacy, and against Europe if need be. But against the latter it had to do this tactfully, even politely.

A case in point was the increased effort of Gideon Welles to find and destroy the C.S.S. *Alabama*—which was busily wrecking Yankee prestige as much as its maritime commerce—and to disrupt "Anglo-Rebel" blockade-running operations.[611] Yet the

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[610] 7-12-1862, Seward to Taylor, and 17-12-1862, Taylor to Seward, *FA*, 771-3.
[611] See for example, 1-12-1862, Welles to Paulding, RG 45, Entry 328.

Secretary was also cautioned by the State Department to tread carefully on British neutrality in the process. His instructions to the ever-assertive Rear-Admiral Wilkes, hovering with his cruisers outside Bermuda, were thus a curious mixture of approval and admonition.[612] How difficult this must have been for Welles, who within a week had to complain himself to Seward about ironclad frigates reported to be building at Glasgow and Liverpool for the Confederate States Navy![613] Perhaps the United States should simply out-bid Southern agents in Britain and buy up all such belligerent vessels? Fox wrote this was "frequently...under discussion, and as a matter of precaution is expensive, as it would involve us in unlimited purchases without entirely curing the evil, since every steamer could not be obtained." The blockade seemed effective enough to stop most runners. In his estimate "not one in twenty have landed a cargo and returned safely to England." The ironclads were another matter. These, he informed John Forbes, should be purchased "if they can be obtained for money. Mr. Welles favors the idea and Mr. Seward simply urges it." How they would keep such a transaction secret from Congress was a further problem, but a future one. For the Department of the Navy, British-built ironclads for the Confederacy were a long-dreaded nightmare, "deserving instant action at any price, since we have not a port north that can resist an Iron Clad of very moderate power."[614] Forbes added that it was doubtful "as to John Bull allowing any decent people to take them away, but even so far it may be well worth trying, then perhaps some friendly getting such ironclads Government, Spain or Portugal, may hereafter buy them of us if we fail to get them out while we are Belligerent!"[615] This was also important: the U.S. might purchase a seagoing ironclad more expensive than the *Dictator* or *Dunderberg*—and never be able to wield that added power against Britain herself someday. What would prevent the Royal Navy from grabbing it up as their own—a

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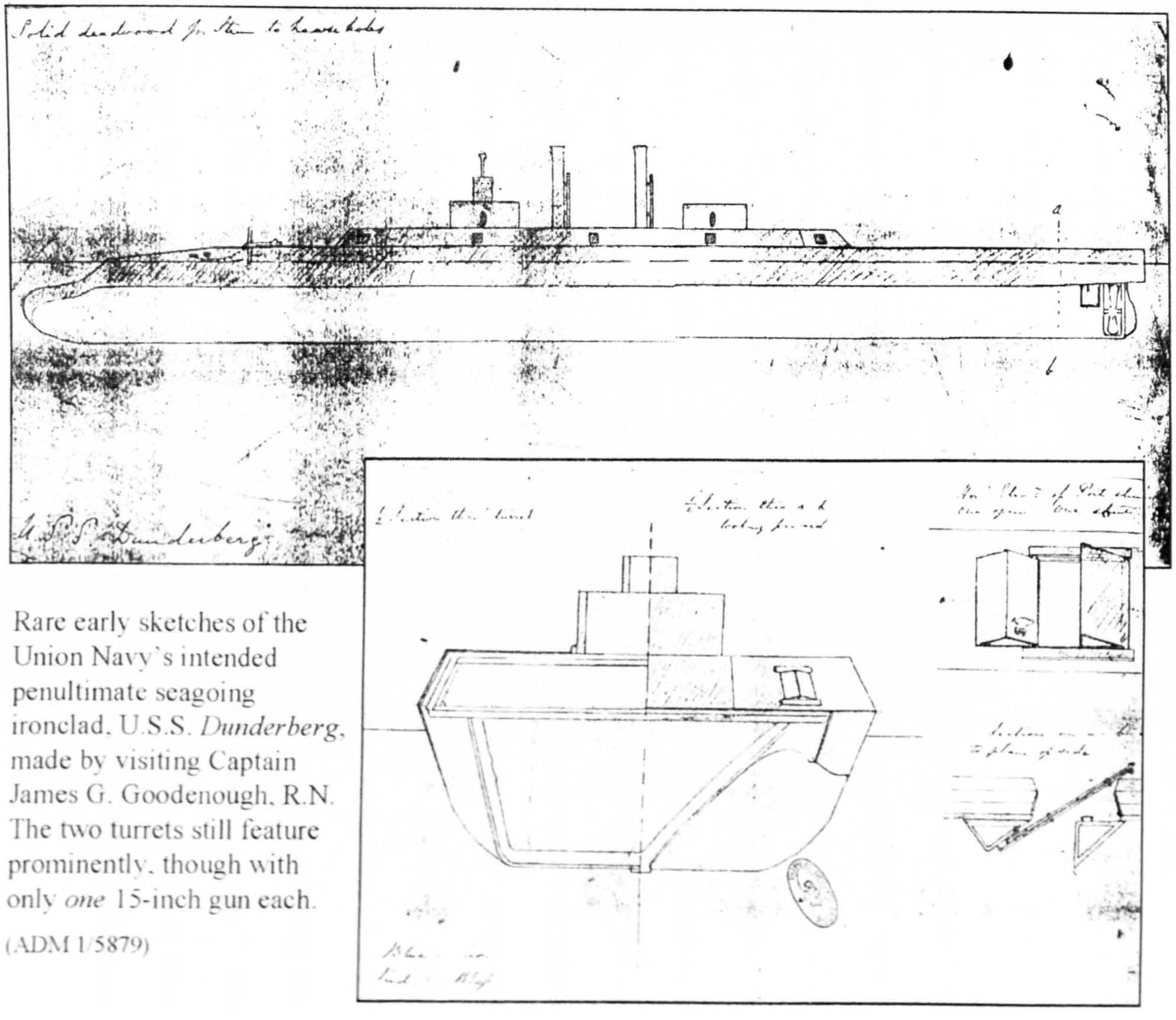
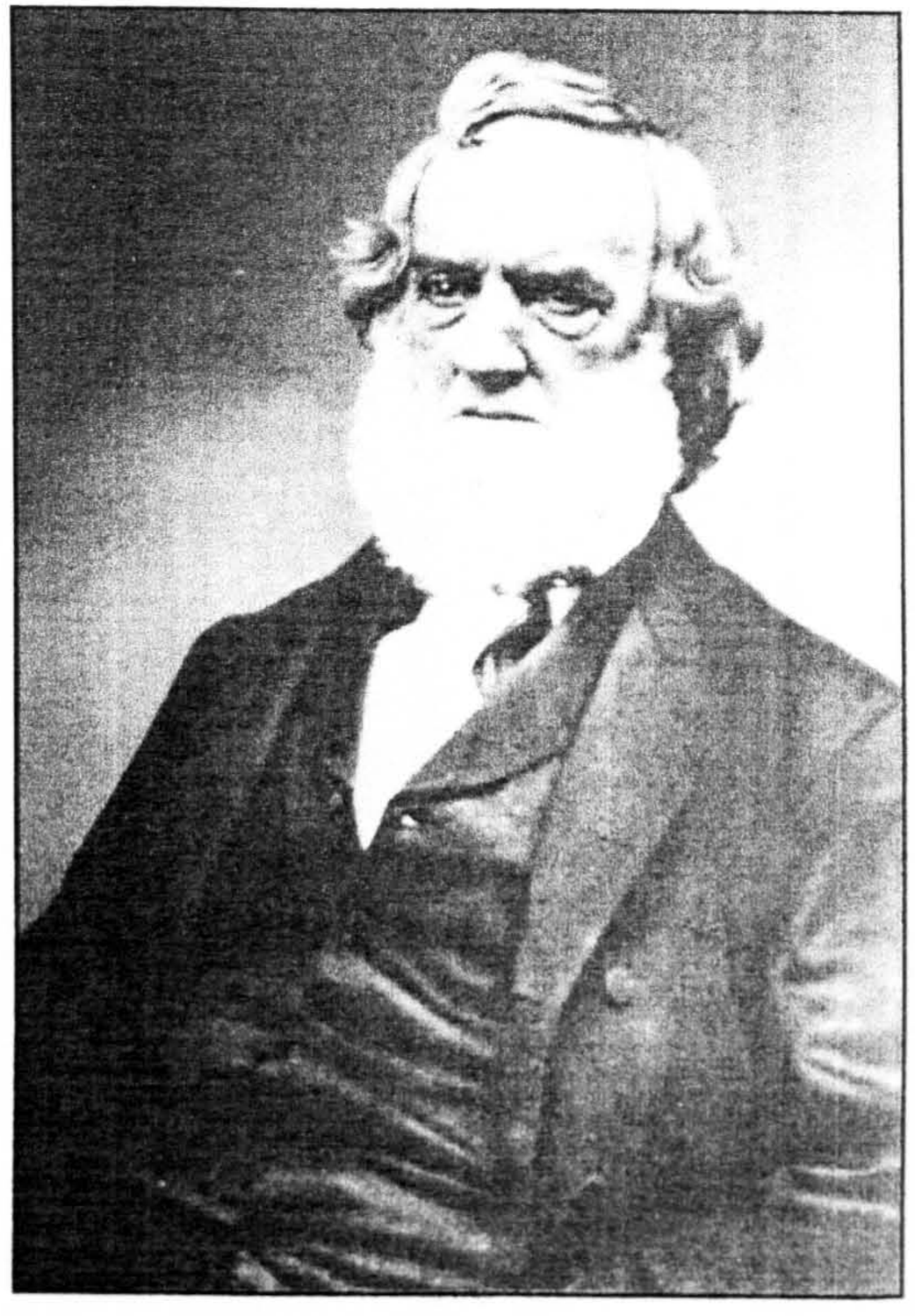
[612] 2-12-1862, and 15-12-1862, Welles to Wilkes, WP.
[613] 8-12-1862, Welles to Seward, WP.
[614] 9-12-1862, Fox to John M. Forbes, FP.
[615] 10-12-1862, John M. Forbes to Fox, FP.



Rare early sketches of the Union Navy's intended penultimate seagoing ironclad, U.S.S. *Dunderberg*, made by visiting Captain James G. Goodenough, R.N. The two turrets still feature prominently, though with only *one* 15-inch gun each.

(ADM 1/5879)



Gideon Welles,
Secretary of the Navy

(from William C. Davis, ed., *The Image of War: 1861-1865*)

donation from the belligerent Yankees, if not the South? Indeed, less than a year later Lord Palmerston shrewdly urged the First Lord of the Admiralty to purchase the twin "Laird Rams" built at Liverpool for similar reasons:

> Now what I wish you to consider is whether it would not be a good thing to buy these Iron Clad Rams for our Navy; we are short of Iron Clads, and it takes Time to build them, we want a good many more to put us on our proper level with France; here are Two nearly finished, no doubt well built, fast sailors, and fitted as Rams; if you want Two such either in our Dockyards or in a private yard you would not get them till the end of next year, and these will be available before the End of this year. If the Federals get them they will strengthen the Yankees against us if they should be disposed and able next year to execute their threatened vengeance for all the Forbearance we have shewn them; if we get these Ships they will tend to give us Moral as well as maritime strength.[616]

At any rate, Welles had taken the lesson to heart and promptly notified Congress that "the line of policy which the events and the necessities of the period have instituted," made it "obvious that other and vigorous should be adopted in order that we may, when circumstances require it, be able to act with effect on the offensive." In order for the U.S Navy to be "formidable abroad as well as at home," Welles continued, it "should have armored vessels of great power and speed and of different construction from any that we now possess as cruisers." The energetic attempts of the South to obtain such ironclads in Great Britain, combined with rising tensions with at least that European Power, meant the Union could not afford to be taken at any such disadvantage, anywhere, if possible. Thus, Welles continued: "We shall require for service in case of a foreign war a class of vessel of this description that will be capable of encountering any enemy and asserting and maintaining our rights in the ocean as well as to assist in guarding our coasts." The Department had "for some months past had in view the construction of two or three powerful Steamers of Iron and to be Iron Clad," and these would help enable the Union to

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[616] 13-9-1863, Palmerston to Somerset, SP.

take the initiative—in a war which did not exist but nevertheless seemed probable. The nation's "turret boats of the Monitor class" were distinctly for coast and harbour defence. Combined, such an ironclad navy would "go far to render us invulnerable as a naval power, capable of resisting the assaults of any nation and always able to assist and maintain our rights at home and abroad."[617]

Yet there were hitches with this ambitious new naval strategy. As Welles, noted, the "cost of the proposed vessels would necessarily be great, so much so that I deem it proper before commencing them that the subject should receive the attention of the Naval Committees and, should they deem it advisable, be submitted to Congress for its sanction and approval." Their ostensible purpose, however, while "taking the offensive" if the United States was "at any time engaged in hostilities with a naval power", was still one of strategic defence, for they "could disperse any blockade that might be attempted"—rather than initiating one of their own. Could not the existing ironclads, especially the monitors, already fulfil that role? Was this not the primary reason for their construction during the previous December, at the height of the *Trent* Crisis? Furthermore, Welles was specifying massive, iron-hulled, seagoing ironclads of the European pattern which would require at least $12 million in addition to the annual estimate, take several years to build, and which the Northern press was actively campaigning against in comparison with American monitors. Was now the time to build such a navy? Could Northern resources even handle such an order, in addition to all those already building for coastal assault and defence, let alone those for riverine warfare? So far there had only been contract delays, labour shortages, and cost overruns; and would these problems become better or worse as the war progressed? These were questions that undoubtedly occurred to knowing members of Congress, though Welles pointedly neglected to address them. Instead, he

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[617] 12-12-1862, Welles to Sedgwick and Hale, RG 45, Entry 5.

resorted to the classic, often unanswerable argument for military expenditure which he must have known had failed to convince politicians long before the Civil War:

> To be prepared for war is one means of preventing its occurrence. It is true wisdom to be ready at all times for any emergency, and hence the proposition for a few powerful Steamers, Iron Clad, and each having the properties of Ram of immense power, with a speed of at least sixteen knots.[618]

In fact, Welles had already outlined the Department's vision for the future in his Annual Report to Congress, dated 1 December 1862. Stymied as he was by the quieter protocol of diplomacy to carry out his duties without openly offending Britain, Welles informed Congress it had been "deemed advisable...that we should have a few large-sized armed cruisers, of great speed, for ocean service, as well as of the class of smaller vessels for coastwise service and defensive operations."[619] In this altered perception of Union ironclad strategy, the monitors would "penetrate the inner waters, rivers, harbors, and bayous of our extended double coast", while vessels similar to the *Warrior* would deal with "foreign powers" on their own terms after all. This was the silent, but strong-armed political leverage of naval power at work. The British Empire would respect nothing less. With a rival fleet of American "Warriors" to contend with, it might respect such power even more. Just as Ericsson promised the previous December that his monitors would serve a vital deterrent function against foreign intervention, the Department's call for high-seas ironclads the following year might force the British Government to more strictly observe its own stated neutrality—and stop further blockade runners, raiders, and even ironclads, from building in private British establishments, being manned by British subjects, and finding quarter in British colonial ports. As Welles wrote: "The time has arrived when, in order to maintain ourselves and our true position as a nation, we must have a formidable Navy, not only of light draught vessel to guard our extensive and

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[618] *Ibid.*
[619] 1-12-1862, Annual Report of the Secretary of the Navy.

shallow coast, but one that with vessel always ready for the service, and of sufficient size to give them speed, can seek and meet an enemy on the ocean."[620]

Yet "great speed" required "enormous steam power", and for this the United States "must have vessels of the greatest magnitude." Iron construction would thus also be needed; and to facilitate this a new, Government-owned naval and industrial base would be necessary. "No private establishment can undertake such heavy work as the Government requires for its armor and steam purposes", Welles pointed out. "Possessing advantages that no nation enjoys, we should avail ourselves of them. Our iron and coal are found in the same region, and we have fresh-water rivers in which iron vessels can be docked and kept clean, and from which all enemies can be excluded." The greatest justification for this sweeping program for an entirely new, Government-controlled naval-industrial infrastructure, was in fact, Welles contended—as did Controller of the Royal Navy Spencer Robinson to the Admiralty—the failings of the private sector in meeting the equally radical demands of modern warfare.

Thus, for the nation-state to wield even more military and naval power, it would need to consolidate even more the means of that power. The national draft, the income tax, the constitutionally-dubious liberties which the Executive branch of the Government had assumed to successfully prosecute the war against the Rebellion, perhaps even the Emancipation Proclamation; all these were symptoms of the same process; and all were contingent upon the shifting circumstances of the Civil War itself, domestically and internationally. Welles' admonition of Congress in neglecting greater investment in Federal power prior to the outbreak of secession also carried a double meaning. Not only was the republic ill-prepared for suddenly waging—if not deterring—a great, modern civil war, but perhaps this state of weakness—or a weak State—was intentional:

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[620] *Ibid.*

> Successive Administrations, with a view to the appearance of economy and a show of small expenditure, restricted the estimates for supplies to amounts barely sufficient to keep its few ships afloat.
>
> The war found us literally destitute of materials in our navy-yards, as well as with but few ships to sustain the national integrity. From mistaken economy, or from design, the Government was, in its need, deficient in ships and destitute of material for their construction.[621]

By this reasoning, the Navy Secretary and his Department could hardly be criticized, much less investigated, by Congress in its dealings with private shipbuilders—its procurement policies—or possibly even its operations, or not, either successful or failed, against the Confederate States. Moreover, the victories the U.S. Navy had achieved in the past year, including above all the vigorous establishment of a grand blockade of the South, despite the limited means at its disposal, merited praise from the nation. For his part, Welles' opinion of the efficiency of the national legislature was anything but flattering. "The demagogues in Congress disgrace the body and the country", he confided in his diary on Christmas Eve. "Noisy and loud professions, with no useful policy or end, exhibit themselves daily."[622]

But the Secretary's Report undercut itself. *For the purposes of the Civil War*, an ironclad fleet *was* already being launched thanks to private industry—and the threat of foreign intervention seemed contained by the small ironclad-monitors with their 15-inch ordnance on the one hand, and the faltering, yet persistent advances of the Union Army on the other. Despite the chronic lack of preparation for a major—and increasingly total—modern war, the nation and its Executive was, by the end of 1862, more powerful than ever before in its history. Did the Navy really need to build ocean-going ironclads

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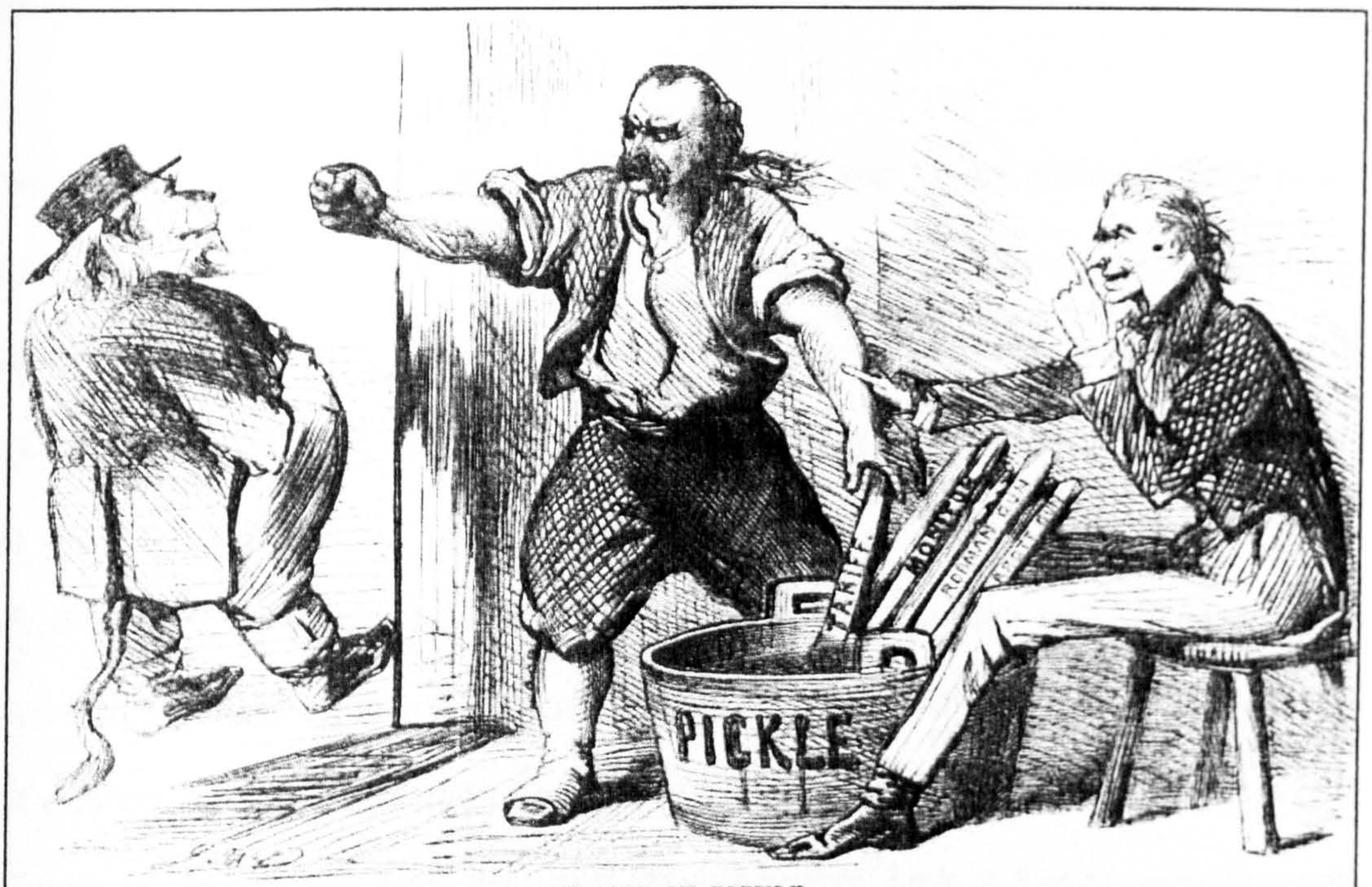
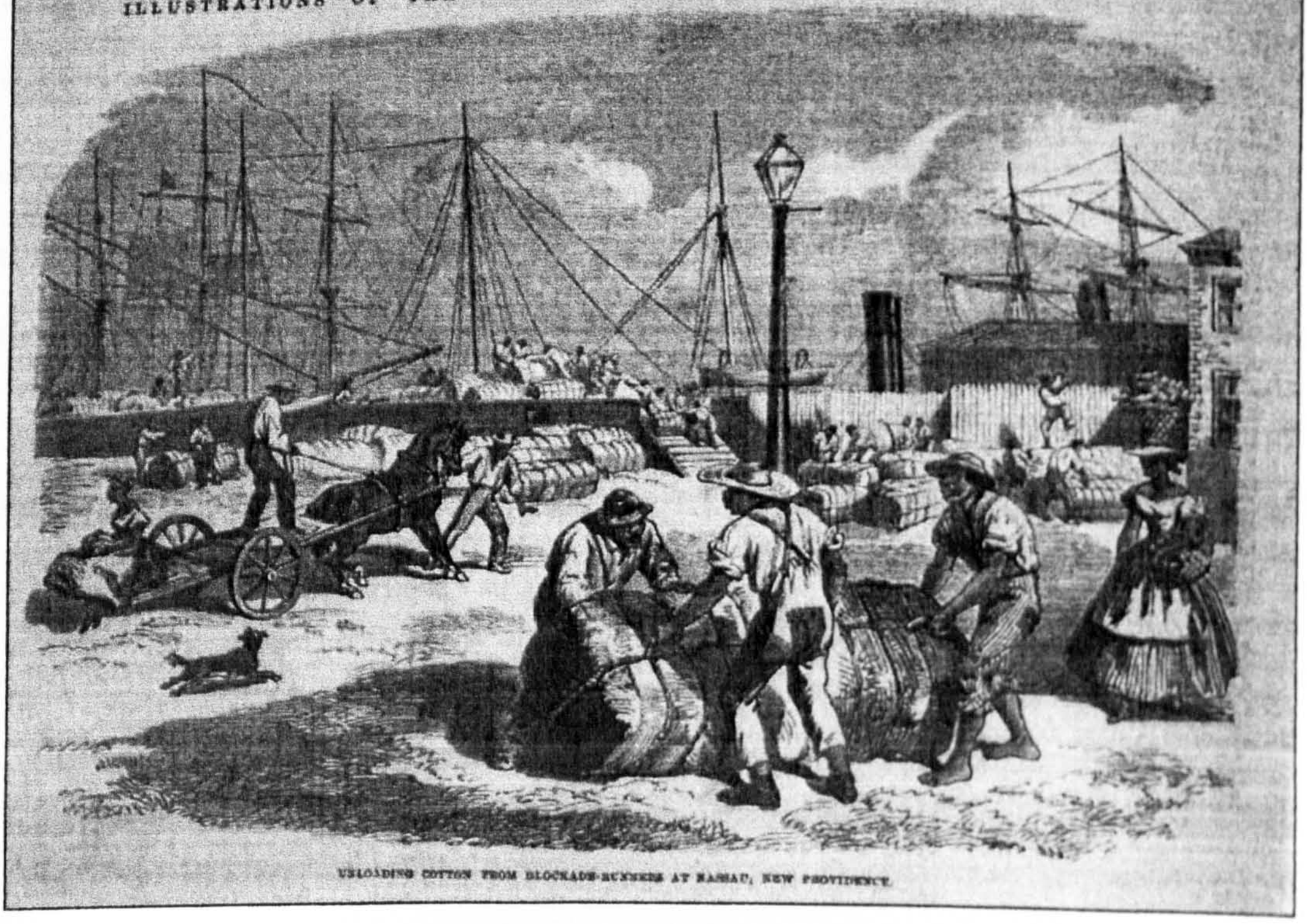
[621] *Ibid.*
[622] Entry dated 24-12-1862, Beale, *Diary*, 1: 206.



THE ROD IN PICKLE.

John Bull. "Irresponsible and degenerate People!" (*Vide London Times.*)
U. S. Volunteer. "What's that? I'll 'degenerate' you, you Old Snarling Hypocrite!"
Uncle Sam. "Easy, my Son; let the *Rods soak a little longer in the Pickle!* Easy a little while longer!"

ILLUSTRATIONS OF THE WAR IN AMERICA, BY OUR SPECIAL ARTIST.



UNLOADING COTTON FROM BLOCKADE-RUNNERS AT NASSAU, NEW PROVIDENCE.

matching European enterprises to "insure peace" when, admittedly, smaller coastal versions were already within the capacity of Northern industry to produce?

It was not clear what may or may not trigger a foreign war. Even greater Federal power might actually disrupt peaceful relations with Britain and France by tempting the United States to "bully" them (a common cry even before the Civil War) into compliance with its views on the nature of the terrible war in America, and the justice of the Union cause over that of the Confederacy. Welles' personal irritation with the British was only one indication of the complexities of maintaining peace, and avoiding war. "It is annoying when we want all our force on blockade duty to be compelled to detach so many of our best craft on the fruitless errand of searching for this wolf from Liverpool", he wrote in his diary concerning the *Alabama*. "We shall, however, have a day of reckoning with Great Britain for these wrongs, and I sometimes think I care not how soon nor in what manner that reckoning comes."[623] Contrast this sentiment with Lincoln's own, in his Annual Address to Congress which began with, above all else, the state of the nation's foreign relations. By June 1862 there were, he wrote, "some grounds to expect that the maritime Powers which, at the beginning of our domestic difficulties, so unwisely and unnecessarily, as we think, recognized the insurgents as a belligerent, would soon recede from that position, which has proved only less injurious to themselves than to our own country." But the fortunes of war had once again changed against the Union. Though the American Civil War "excited political ambitions and apprehensions which have produced a profound agitation throughout the civilized world", the U.S. had carefully "attempted no propagandism, and acknowledged no revolution; but we have left to every nation the exclusive conduct and management of its own affairs":

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[623] *Ibid*, entry dated 29-12-1862, 1: 207. Contrast this sentiment with Lincoln's own Address to Congress.

> Our struggle has been, of course, contemplated by foreign nations with reference less to its own merits than to its supposed and often exaggerated effects and consequences resulting to those nations themselves. Nevertheless, complaint on the part of this Government, even if it were just, would certainly be unwise.[624]

A strong defence was therefore one thing; the threat of attack was another. Nothing served Union diplomacy abroad better than a strong Federal military which could demonstrate its power by successfully crushing the South; and for that purpose blue-water ironclads of the "greatest magnitude" Welles had already assured Congress could not "nearly approach our shores..."[625]

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[624] 1-12-1862, Message of the President of the United States.
[625] 1-12-1862, Annual Report of the Secretary of the Navy.

Conclusion

Both Britain and the United States suffered simultaneous—and interrelated crises—of civil-military relations during this period under examination, though with remarkably different outcomes. If historians today perceive that the Victorian ideal of the Hero-Inventor fighting against the "System" was overplayed by the public, neither can professional organisations themselves, especially government ones like the British Admiralty or the U.S. Department of the Navy, be considered victims wholly "exploited" by crank inventors and greedy entrepreneurs.[626] The truth is that it was not about the "Individual vs. the Institution", but Individuals vs. other Individuals. Cowper Coles made the mistake of attacking Edward Reed as part of an institution, rather than as a rival engineer or shipbuilder. John Ericsson's fame on both sides of the Atlantic only added a personal anxiety to this public campaign, when actions would have spoken much louder than words. Likewise, John Lenthall and Benjamin Isherwood's complaints of private contractors' influencing Fox and Welles did not conceal the fact that Ericsson, the individual really in question, offered to meet the policy needs of the Navy, established by its civilian leaders, better than they could—or would—do, with their preference for turret-ships loosely based on Coles' ideas; the customary deference to British practices only serving to irritate the Navy Department during the Civil War.

The great controversies between Ericsson and various naval officers over the *Passaic* class monitors were also very much personal struggles, which could not, however, be taken personally. It did Ericsson little good to blame "sailors". In addressing their complaints Ericsson appreciated that only detailed problem-solving would settle matters

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[626] See Andrew Lambert, "The Ship Propeller Company and the Promotion of Screw Propulsion, 1836-1852", in Robert Gardiner (ed.), *The Advent of Steam: The Merchant Steamship before 1900* (London: Conway Maritime Press, 1993), 136-7; also Gideon Welles, "The First Iron-Clad Monitor" in *The Annals of War* (Dayton, OH: Morningside House, Inc., 1988), 17-31, where the former Secretary bitterly denied his Department had not paid Ericsson and his backers for the *Monitor* by the Battle of Hampton Roads, attacked Stanton and the Army, and was willing to place any "money-making motives" alongside Ericsson's "patriotism". See also Church, *Life of Ericsson*, 1: 192. For designing the entire *Passaic* class of Civil War monitors, Ericsson "profited" from their contractors' use of his patented lever-engine "one per cent on the contract price," and "3/8 per cent of the contract price" for the *Canonicus*-class; 16-4-1864, Ericsson to Gregory, EPLOC; also 24-4-1862, Ericsson to Welles, EPPA.

with Fox and Welles. This would also serve to incriminate his opponents for him. "Without intending any disrespect to the commander of the Passaic [Drayton]," Ericsson thus wrote to Welles on 8 February 1863, "I cannot abstain from calling your attention to his singular custom of drawing on the imagination in order to show what might have happened under certain contingencies, and what dire consequences would have resulted from occurrences which happily did not take place."[627] Ironically enough, Reed and Robinson might have made a similar observation about Coles.

At the beginning of the Civil War it was not clear to either Great Britain or the United States which was more important, defending one's own ports or attacking those of the enemy? Certainly the *Trent* Affair succeeded in confirming the Union Navy's predisposition to concentrate its resources on coastal vessels, and in giving a double meaning to John Ericsson's original "Monitor"-type ironclad. The emphasis of Union ironclads especially after Hampton Roads was upon their ship-killing abilities, whether to defend New York Harbor, for example, from British ironclads, the blockade from more Confederate rams (or European interference), or indeed to help crush the naval defences of Southern ports. Because of this concentration upon coastal operations, the Union Navy can be said to have succeeded in its choice of strategy—at least as far as the foreign threat was concerned. With various Union ironclad descriptions before him by the beginning of 1863, from American newspapers and Royal Navy officers under Milne's command, Robinson reported to the Board of Admiralty that "there appears to be no novel or important principle elucidated by these constructions." Those that "seem to possess sea going qualities", particularly the experimental broadside-ironclad U.S.S. *New Ironsides*, "are in no way superior to the French *Gloire* or *Invincible* or the Ships of the *Royal Oak* class." The obvious bulk of the armoured Federal warships were "mere Rafts carrying very few heavy guns propelled at moderate speed, and though perfectly well adapted for

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[627] 8-2-1863, Ericsson to Welles, *Report of the Secretary of the Navy in Relation to Armored Vessels*, 601.

the Inland waters of that great Continent, and most formidable as Harbour Defences, are not in any sense sea going Ships of War":

> This is not said with any view of disparaging the Skill and industry which has been displayed in their construction, still less with any intention of undervaluing the enormous defensive power which has thus been developed: a power which I believe renders the Americans practically unassailable in their own waters...
>
> If again, Admiral Milne means that we have not yet an Iron plated Flotilla capable of going into the inland waters, rivers and Harbours of the United States, and when there, able to fight an Action on equal terms with the description of Vessels which will be found awaiting us, he is perfectly right and it will be only necessary to observe that such a proceeding on our part is simply impossible.[628]

Against combined Confederate defences, however, the Union's preference for coastal ironclads—and especially monitors—held important disadvantages. Monitors could not be expected to out-gun forts, unless they were given adequate time and army-support, or were massed in such numbers as to be instantly irresistible. Even so, no ironclad design was better suited for running gauntlets than the light-draft, low-freeboard, heavily-armoured monitor. The question then revolved around whether or not simply running a gauntlet successfully would guarantee victory—would compel a determined enemy to surrender? Added to this vexing complication was the simple yet effective countermeasure of obstructions and especially minefields. But if coastal assault ironclads would find these defences difficult to overcome, seagoing ironclads would most likely have found them all but impossible to negotiate.

The Royal Navy, by contrast, never openly held shallow-drafted ironclads to be worthless, whether for defending British ports or attacking those of an enemy. But neither could such vessels be relied upon to openly "command the sea". Maritime or

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[628] ADM 1/5840, 30-1-1863.

naval war was traditionally acknowledged as best fought on the strategic offensive, with blue-water cruisers taking the initiative, driving a rival back upon his own coastline, bottled up in his own harbours, and thereby leaving the sea-lanes open for imperial trade and communications, as well as strategic, waterborne mobility—and depriving the enemy of the same. Superior British imperial resources—financial, industrial, maritime—thus protected, victory was only a matter of time. The relatively "sudden" threat posed by French ironclad-frigates necessitated a British reaction obsessed with the sea, not the shoreline. Fortifications, the Defence Committees of 1860 and 1861 insisted, would more properly take care of national defence by "[setting] our fleet free, to operate offensively against the enemy or defensively for the protection of our shores..."[629] Between the taxing demands of building large iron-hulled seagoing ironclads and fortifications, expressly coastal defence ironclads, turret-ships on Coles' pattern, though continually endorsed by the Admiralty, were routinely left at the bottom of annual defence estimates.

A problem emerged with this strategy, however, when Great Britain also found herself forced by the American Civil War and particularly the *Trent* Affair to consider how the defence of the Empire and an assault upon Union national defences was to be actually carried out. In his authoritative, multi-volume study of *The British Navy: Its Strengths, Resources, and Administration* (1882), Sir Thomas Brassey observed that in 1870: "the failure of the French fleet, owing to the deficiencies of vessels of light draught adapted to coast service, was fresh in the recollection of the maritime world":

> Our own experience in the Baltic campaign, when a powerful fleet of line-of-battle ships and frigates was condemned to inaction for want of gunboats, and the success of the operations against the Confederates conducted by the naval forces of the United States, with a large flotilla of vessels of light draught, seemed to afford conclusive evidence of the necessity for

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[629] *Letter Addressed by the Royal Commissioners on National Defences*, 11; see WO 33-10.

> completing our naval *matériel* with a due proportion of vessels adapted for service on the coast.

Nevertheless, Brassey, continued, the "view adopted...has been that coast service vessels can be promptly improvised, and that our efforts should therefore be concentrated in time of peace on those classes of ships the construction of which must necessarily occupy a long period of time." This indeed explained much of the course of the early British ironclad program. But international crises often erupted before even coastal defence vessels could be "improvised". This was the state of both the British and Union navies during the *Trent* Affair—though only the latter force may be said to have adapted itself accordingly. "It is a point to be always borne in mind, that the best ships for coast defence are also the best for coast attack," Brassey concluded, and the "monitor is, *par excellence*, the best type of vessel for the operations of naval warfare on the coast."[630] One wonders how radically different history may have been had Napoleon III originally chosen to concentrate on armoured batteries rather than frigates, and Britain again countered the French initiative appropriately—a question even J. P. Baxter failed to address. Instead, Hampton Roads was seen as by Baxter as having "exerted on the building policy of the administration an influence which in one respect may be thought pernicious." Why? Because (in an all-too often repeated display of historical determinism) "the opportunity for building a high seas ironclad fleet was largely overlooked."[631]

What this thesis has avoided is a "nuts-and-bolts" comparison between Union and British ironclads of the Civil War era which might be expected. Yet this would have been, as Stanley Sandler suggested, an exceedingly tedious exercise and probably misleading in any case. Enough of these comparisons abound, from this period in question and ever

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[630] Sir Thomas Brassey, *The British Navy: Its Strength, Resources, and Administration*, 3 vols. (London: Longmans, Green, and Co., 1882-3), 2: 380-7; also 3: 72.
[631] Baxter, *Introduction*, 302.

since, and are more noteworthy for what they tend to overlook. It is pointless to assess a warship's tactical strengths without reference to the wider strategic imperatives which intertwined—and often clashed—with them. As Donald Canney noted:

> In the United States, the reflection of these world technological developments was distorted: capital ships such as the revolutionary British *Warrior* of 1860 did not play a significant part, and the emphasis was on light-draft river and coastal vessels—a consequence of the Civil War, a conflict where inland and shoal water warfare was virtually the rule (excepting only the operations of the cruisers on the high seas). An American *Warrior* would have been simply useless in this context, except in the remote possibility of intervention by a European power.[632]

This thesis has shown, however, that even the Union's coastal ironclads, and especially the monitors, have been previously assessed by a sort of Civil War strategic near-sightedness; a predilection for American self-absorption. It is *not* the case, as Canney added, that "any attempt to compare American and European ironclad fleets of the era is infelicitous: neither fleet could meet the other on common terms."[633] On the contrary, it was precisely *because* of this historically unique and decisive relationship that the comparison has been made—and not so much on the nuts-and-bolts level, comparing smoothbore gun with rifled, and turret with broadside, but looking beyond the strict confines of the American shoreline; looking outwards from a Union perspective, and inwards from a British one. After all, if "an American *Warrior* would have been simply useless in this context," how might a British *Warrior* have faired? This was a question which drove much of the Union's ironclad program in the deciding years of 1861-1862, when European intervention was considered far from "remote".

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[632] Canney, *Ironclads*, 1.
[633] *Ibid*, 9.

Another notable aspect which has emerged when "assessing the comparative strategic and tactical strengths of British and Union ironclad programs of the Civil War era" is how Britain and the Union actually assessed each other's ironclads—the *perception* of power. Ericsson was quick to realise that the monitors, if not also his own public image, served an important propaganda role in sustaining Northern morale, depressing the South's, and warning off Europe. Nor was he alone in this conviction. Imperial Russia, still smarting from the Crimean War, and facing renewed Anglo-French opposition to its suppression of the Polish Revolt, was the only major European Power during the Civil War which expressed unconditional morale support for the Northern States. Both nations recognised a further similarity between Tsar Alexander II's freeing of the serfs in 1861 and President Abraham Lincoln's Emancipation Proclamation. When the Tsar narrowly escaped assassination on 16 April 1866, Congress passed a joint resolution on 16 May which expressed a deep personal sympathy, especially given the terrible memory of Lincoln's assassination the year before. Assistant Secretary of the Navy Gustavus Vasa Fox was chosen to personally convey the message to Russia, "in a national vessel". For this purpose Fox without hesitation chose one of the U.S. Navy's newest monitors, the double-turreted, twin-screwed (and Navy designed) U.S.S. *Miantonomoh.* In fact he leaped at the opportunity.

Triumphant as the Union eventually was during the Civil War, professional scepticism on both sides of the Atlantic continued to ebb and flow for and against monitors as successful warships. Though these vessels rode out many storms throughout the Civil War, it was the gale that sank the original prototype on New Year's Eve, 1862 that stuck in everyone's mind. When Ericsson's single-turret *Passaic* class monitors were outgunned by the network of fortifications ringing Charleston Harbor on 7 April 1863, their naval officers (led by DuPont, who was in turn undoubtedly influenced by Drayton) initiated a stinging publicised controversy against the Administration's decision to invest

in "machines".[634] At the same time, however, the monitors' 15-inch guns had proven their worth against enemy ironclads. Less than two weeks before his fateful charge against Fort Wagner (18 June 1863) Union Colonel Robert Gould Shaw, of the famous 54th Massachusetts Infantry regiment, visited the U.S.S. *Montauk* off Port Royal. "The officers of the navy have by no means as much confidence in the Monitors as the public at large," he wrote to his wife, "and say they can be of service only against other iron-clads, or wooden vessels, and brick-and-mortar walls. Forts of other descriptions, such as field-works and sand-batteries [like Wagner], they think would get the better of them." Though Shaw was exposed to the worst anti-Ericsson gossip possible—at the worst time possible—he also visited the captured ironclad-ram C.S.S. *Atlanta*, quickly pummelled into submission at Wassaw Sound by the *Weehawken* (under Captain John Rodgers) less than three weeks before. This he described as a "very powerful" though "roughly finished" armourclad which "would have made great havoc in our blockading fleet, if she had got out..." Despite their defects, Shaw concluded the monitors were "terrible engines, and wonderful in their strength."[635]

Between the periodic boastings—and threats—of the Yankee press against British naval pre-eminence, and a Congressional inquiry in 1864 which could find no evidence to censure the Navy Department, the British Admiralty dispatched Captain James G. Goodenough, R.N., as an official naval attaché to Washington. His lengthy report concluded that "altho' not one of them could be sent to sea to cruize against an enemy or for any but a special object involving not more than 48 hours' absence from port, it appears to me that...["as a defensive force"]...they would be very valuable."[636] Within a

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[634] See Richard S. West, Jr., *Gideon Welles, Lincoln's Navy Department* (New York: Bobbs-Merrill Co., 1943), 311-14.

[635] 6-7-1863, Robert to Annie Shaw, quoted from *Letters of Robert Gould Shaw* (Cambridge: University Press, 1864), 319-20; also 317.

[636] Capt. J. G. Goodenough, "Report on Ships of United States Navy 1864", ADM 1/5879, 33-4. See also Richard M. Basoco, William E. Geoghegan, and Frank J. Merli, eds., "A British View of the Union Navy,

year even the London *Times* was willing to assert that a "perfect Ironclad is an imperfect seaboat":

> That is the maxim which up to this time might be reasonably propounded as the deduction from all our experience. The best illustration of the doctrine was given by the American Monitors. Probably no fabric ever combined a greater capacity for fighting with a smaller capacity for swimming than Mr. Ericsson's original model.[637]

Joining Fox on the *Miantonomoh*, however, was Goodenough's successor from 1865, Captain John Bythesea.[638] His 1871 testimony, before yet another Parliamentary Ship Design Committee, noted the passage was "quite dry". The monitor's ventilation "was exceedingly good", but when the engines were stopped "the lower deck then began to get stuffy and nasty". Still "there were three pairs of engines to supply air," and "one pair, or even one cylinder, was sufficient to do the duty". Through an armoured ventilating shaft on deck, "they sucked the air down, and the foul air went up the turrets." There was also "an arrangement for distributing the air, so that any officer, when in his cabin, could turn a little rose, and have as much air as he liked, or, by closing the rose, the air was turned off." Sickness averaged 3 per cent. Even so, Bythesea concluded, "I think if a vessel is to go to sea, or go from port to port, in all weathers and at short notice, a higher freeboard would be better. The precautions that have to be taken on each occasion that the 'Miantonomoh' goes to sea are very great, and entail a great deal of work, much of which would be obviated by having a higher freeboard." Otherwise, he "saw no necessity for any increased height."[639]

1864: A Report Addressed to Her Majesty's Minister at Washington", *American Neptune* 27 (January 1967), 30-45.

[637] 1-11-1865, London *Times*.

[638] See 15-5-1866, Bruce to Earl Clarendon, FO 5/1065; also 1-3-1865, Russell to Somerset, SP. Bythesea's own "Remarks on the U.S. Navy", dated 19-8-1865, can be found in ADM 1/5954.

[639] 1871 Ship Design Committee, *PPs*, 34-41. See also the copy of Bythesea's report to Clarendon, dated 16-6-1866, including a log account of the *Miantonomoh*'s first crossing, in ADM 1/5992.

As soon as the U.S.S. *Miantonomoh* entered Queenstown, on 15 June 1866, anchoring between the towering broadside-ironclads H.M.S. *Black Prince* and *Achilles*, a fresh storm of public controversy broke over England. The day before her arrival, the Admiralty had carried out an unusual and severe target practice by the Reed-designed central-battery ironclad *Bellerophon*—against the turrets of Coles' converted *Royal Sovereign*. The tests embarrassed everyone involved, and it was with no small amount of irony that the same issue of the *Illustrated London News* which covered the event also depicted the presence, beyond all expectation, of a Federal monitor in Ireland. Here was American naval and technological prowess—what the Royal Navy considered lunacy—in the face of apparently endless British experiments and uncertainty. Crowds were flocking to Queenstown to take a look, "greatly to the profit of the railway and steamer companies," added the *I.L.N.*[640]

When the *Miantonomoh* proceeded next to Portsmouth the attention of the nation followed her. "A strange vessel, with a strange figure and still stranger name, now lies at Spithead," wrote the London *Times*. "She is a real genuine Monitor, a true specimen of that singular fleet on which the Americans rely for their position on the seas." "As these vessels resemble no other floating things," the *Times* reasoned, "it follows almost inevitably that if the American shipbuilders are right ours must be wrong, and it is our imperative duty to investigate the subject without prejudice or delay."[641]

Nor was it solely a question of seaworthiness. A thorough inspection of the *Miantonomoh* left a *Times* Correspondent observing that "as a war machine for close heavy fighting she appears to be perfect." The 15-inch Dahlgren smoothbore was itself a serious contender against the "best present ship gun [in the Royal Navy], the 12-ton 9-

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[640] 30-6-1866, *The Illustrated London News*, 639-41; 651-3.
[641] 27-6-1866, London *Times*.

inch rifle, or 250-pounder," while the iron gun-carriages and slides "were superior to anything of the kind previously seen in this country...Two men can run the gun in or out with ease, and one man can regulate the compressors."[642] *The Scientific American*, which had battled for years with the opinions of the British *Engineering* journal and *Mechanics' Magazine* on monitors, now quoted them eating their own words.[643] "Everywhere it is our resources, strength, inventions," Fox wrote to Welles from London, "[the Monitor] is a wave of triumph for us all over this country..."[644] The *Army and Navy Journal* was more blunt, headlining the "Victory of Monitors". "[The London *Times*] needed only a sight of the Monitor to complete its gradual conversion to a belief in the system which the English press so long ridiculed. And now, like all new converts, it shames the old believers with its zeal." "The Monitors have won," it concluded. "It is plain they do not longer need advocacy."[645]

But what had the monitors "won"? Where exactly was the "victory"? More than proving mere technical points in one warship design over another, Fox and Ericsson succeeded in winning the confidence of not just the American public but the respect of British policy-makers as well—a victory in a long cold war of deterrence at the very heart of the Civil War, not at its borders. It was clear that Lord Palmerston recognised ironclads as powerful new playing pieces on the realpolitik-chessboard of international diplomacy. As early in the Civil War as June 1861 the British Prime Minister was keen to utilise them in a show of force against the Union, for "their going could produce no bad Impression here," he wrote to Somerset, "and depend upon it as to Impression in the United States the Yankees will be violent and threatening in Proportion to our local weakness and civil and pacific in Proportion to our increasing local strength."[646] Perhaps Abraham Lincoln

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[642] 28-9-1866, London *Times*.
[643] 14-7-1866, *The Scientific American*, 34. See also 13-7-1866, Ericsson to Wise, EPPA.
[644] 29-6-1866, Fox to Welles, WP.
[645] 4-8-1866, *Army and Navy Journal*, 797.
[646] 23-6-1861, Palmerston to Somerset, SP.

Striking illustrations of shifting British naval confidence from *Punch*; the left, 14 December 1861, during the *Trent* Crisis; the right is from 18 August 1866, following the visit of the monitor U.S.S. *Miantonomoh* to England.

referred to the Union's own ironclads as much as its veteran armies when he declared towards the end of the war that "England will live to regret her inimical attitude toward us." The resolution of the *Trent* Affair, he recalled, was "a pretty bitter pill to swallow, but I contented myself with believing that England's triumph in the matter would be short-lived, and that after ending our war successfully we would be so powerful that we could call her to account for all the embarrassments she had inflicted upon us."[647] Until Britain could overcome the Union's new coastal defences she could not apply the same political leverage with her naval power from early 1862 as she had during late 1861. By September 1864, Palmerston complained to Lewis' successor as Secretary for War, Earl de Grey[648], that the Royal Navy still had no heavy guns which would smash and sink the Monitors."[649]

British naval supremacy by the mid 19th-century was traditionally expected to act as a diplomatic counterweight to the threat posed by the mass-armies of continental powers such as France, Russia and the United States. The rise of a strong navy in any or all of these powers would upset this often less than obvious "balance". It was all too easy, perhaps, for a naval power such as Britain to wield her influence in foreign affairs (let alone "defend her interests" worldwide) and to tip the scales in her favour during international crises. The Royal Navy both neutralised the threat posed by invading armies—given the geography of the British *Isles*—and therefore offered a means for striking soft targets with impunity. Palmerston's informal 'chat' with the Austrian ambassador, Count Apponyi, during the Schleswig-Holstein crisis and Prusso-Danish War stood as a perfect example. England favoured Denmark; her independence as a State was vital to keeping British access to the Baltic. Writing to Russell, the Prime Minister

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[647] Horace Porter, *Campaigning with Grant* (New York: Da Capo Press, 1986, reprint of Century, 1897), 407-8.
[648] George Frederick Samuel Robinson, 3rd Earl de Grey and 2nd Earl Ripon.
[649] 11-9-1864, Palmerston to de Grey, PP, (Private Letterbook). Lewis had died on 13-4-1863.

recounted "I begged [Apponyi] that nothing I might say should be looked upon as a Threat but only as a frank explanation between Friends on matters which might lead to Disagreements, and with regard to which unless timely explanation were given as to possible consequences of certain Things a Reproach might afterwards be made that timely explanation might have averted disagreeable Results."[650] Palmerston was more frank with Queen Victoria, who vehemently opposed his stance on Denmark, and who had also opposed his penchant for foreign interference more than once. That "England, the first and greatest Naval Power," he wrote, "should allow the Austrian fleet to sail by our shores, and go and conquer and occupy the island capital of a friendly power, towards which we are bound by national interests and Treaty engagements, would be a national disgrace to which Viscount Palmerston, at least, never would stoop to be a party. It makes one's blood boil even to think of it; and such an affront England, whether acting alone or with Allies, ought never to permit."[651] As a result, continental powers often resented the "Mistress of the Seas", and especially Palmerston's rather imperious foreign policies. For the United States during the Civil War the *Trent* ultimatum (which Britain herself considered a response to American "arrogance") was the final proof of Britain's far-reaching pretentiousness.[652]

No other single military tool of U.S. diplomacy was considered more efficient—specifically intended to answer British interference in American affairs—than the ironclad; specifically the U.S.S. *Monitor*. John Ericsson went even further, trying to atone for his own steep personal sacrifice. Years after the Civil War he confided to his brother: "My future, and my success in the world, required that I should not be troubled with children or with a wife who had a full right to live with me." Fate had taken him

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[650] 1-5-1-1864, Palmerston to Russell, GP. See also Chamberlain, *Pax*, 116-18.
[651] 22-2-1864, Palmerston to Victoria, quoted from George Earle Buckle (ed.), *The Letters of Queen Victoria*, 2 vols. (London: John Murray, 1926) 1: 161-3. See also Brian Connell, *Regina v. Palmerston: The Correspondence Between Queen Victoria and Her Foreign and Prime Minister, 1837-1865* (London: Evans Brothers, Ltd., 1962), 349.
[652] See for example 14-1-1862, *CG*, 333.

instead to America, where it was "the cannon in the rotary turret at Hampton Roads that tore the fetters from millions of slaves, and afterward made the French abandon Napoleon's project in Mexico."[653] In this mid-Victorian recourse to arms—both between the Northern and Southern states, and internationally—despite "Progress", despite "Civilisation", despite even "Christianity"—nothing offered a more reliable assurance of victory, it seemed, than a war machine itself coolly calculated upon measurable, immutable principles of opposing force and resistance. This was the new equation in modern conflict. Like Newton's Third Law of Motion, whereby every action causes an equal and opposite re-action, aggression had provoked reaction. Deterrence had led to the development of counter-deterrence. As Henry Adams in London marvelled at the brute ascendancy of iron over wood at Hampton Roads, and the contest of iron against iron on the testing grounds at Shoeburyness, he could not help darkly reflecting how "Man has mounted science, and is now run away with it":

> I firmly believe that before many centuries more, science will be the master of man. The engines he will have invented will be beyond his strength to control. Some day science may have the existence of mankind in its power, and the human race commit suicide by blowing up the world.[654]

The fact that such a mechanised ironclad did not directly threaten Britain's national security as the French armoured frigates—though it did represent serious challenges to her imperial commitments—was, however, beneficial in more ways than one. "The one great dread of the prime minister, as it regards American affairs," Charles Francis Adams wrote to Seward in late March 1865, "is that of appearing to be bullied." As monitors constituted more of a defensive deterrence (rather than British ironclads, which reflected a naval strategy and foreign policy of offensive-deterrence), "this feeling, shared in some

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[653] 27-12-1867, John to Nils Ericsson, quoted from Church, *Life of Ericsson*, 2: 219.
[654] 11-4-1862, Henry Adams to Charles Francis Adams, Jr., Ford, *Cycle of Adams Letters*, 1: 134.

degree by both branches of the English race," and which Adams observed "interposes most of the obstructions in the way of their harmony"[655], was left to evaporate harmlessly away.

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[655] 30-3-1865, Adams to Seward, *FA*, 298.

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